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14. ABSTRACT: Background: Posttraumatic stress disorder (PTSD) is considered a major public health problem in the U.S. because it has fairly high prevalence and because people with PTSD often have problems with their work, relationships, and health. There are effective treatments for PTSD, such as prolonged exposure therapy (which works by inviting people to revisit their memories of traumatic events and to face objectively safe situations they have avoided). However, individuals with PTSD may not get the treatment they need because they live in rural locations with no trained clinicians or because they have transportation problems (for example, the distance makes frequent travel unfeasible or they cannot afford gas). Some individuals with PTSD do not feel comfortable driving (due to fears of roadside bombs) or they may feel uncomfortable in formal hospitals or other crowded places. One new method of giving treatments is by using interactive video equipment (called "telemedicine"), so that the patient and his therapist can talk with each other and see each other over a monitor. Objectives/Rationale: The goal of the study is to compare exposure therapy in a usual format (face-to-face, in-person therapy) to the therapy in a telemedicine format. This project will help determine whether telemedicine can be used to provide needed therapies to veterans with PTSD in remote locations. Study Design: 210 military veterans with PTSD will receive exposure therapy either by telemedicine or in-person care. Progress: To date, 195 veterans have been enrolled in the study. PTSD symptoms and cognitive functioning are measured before treatment begins, at the completion of therapy, and at a 6 month follow-up assessment. At the end of therapy veterans and therapists are asked how satisfied they were with each type of treatment.

15. SUBJECT TERMS
posttraumatic stress disorder; telemedicine; telemental health; telehealth; cognitive processing therapy; cognitive-behavioral therapy; veterans

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Introduction:

Posttraumatic stress disorder (PTSD) is a potentially debilitating disorder that is associated with physical and other psychological problems[1]. Lifetime prevalence in the United States is estimated at 6%[2], but among some samples of military Veterans the prevalence has been two or three times higher.[3,4] Although effective treatments for PTSD have been developed, there is evidence that individuals with PTSD may not have access to these treatments or may fail to receive an adequate amount of treatment.[5,6] Insufficient treatment has been associated with the symptoms of PTSD, such as avoiding talking about traumatic events; stigma about mental health symptoms or treatments; and other barriers to care such as transportation problems (e.g., acquired fears of driving or a lack of time or money for transportation).[7,8] Approximately 40% of military Veterans in the U.S. live in rural settings[9], and rural settings are known to have more limited availability of empirically-based treatments for PTSD and other disorders[9-11].

Telehealth, or telemedicine, has developed to address some of the obstacles to obtaining services. The technologies used in telehealth include telephones, email, websites, and smart phone applications, among others. Videoconferencing psychotherapy (VCP) has been successful in treating psychological problems through real-time interactive video technology, and several studies have explored VCP for PTSD[12,13]. This approach allows a therapist in one location to engage a patient in treatment from another site. In addition to reducing the time and money involved in transportation, VCP can extend access to individuals with limited mobility due to older age, injury, or other complications.

VCP has demonstrated satisfactory outcomes and satisfaction by clients and therapists in several studies[14-20], but few large controlled studies of trauma-focused therapies have been conducted. Exposure therapies are the most widely studied type of psychotherapy for PTSD, with strong empirical support for reducing PTSD severity[21]. Prolonged exposure (PE) is one type of exposure therapy that has been successfully applied to individuals with PTSD due to many types of traumatic events. This manualized treatment is designed to reduce the severity of PTSD by exposing clients to feared but safe situations (in vivo exposure) and memories (imaginal exposure) over the course of 8 to 15 90 minute sessions[22]. However, it has been suggested that exposure therapies may pose unique challenges when provided in a telehealth format due to the nature of the assigned exposure activities[23].

The current study is the first randomized controlled trial (RCT) comparing the effectiveness of PE in person (IP) vs. a VCP format. A non-inferiority design was used to test whether VCP was "as good as" IP in several domains. We predicted that improvement in PTSD total symptom severity score (as measured by clinician ratings) and health-related quality of life would not be inferior in videoconferencing as compared to in-person, and similarly that patient satisfaction and therapist satisfaction would show non-inferiority between conditions. We also used a linear mixed-effects model to test whether executive functioning appeared to be associated with PTSD severity change for all subjects at post-treatment or follow-up.

Body:
In the "San Diego Telemedicine Exposure Project" (STEP), we completed recruitment and enrollment of subjects while providing psychotherapy in both IP and VCP formats. We were able to complete our estimated enrollment and collect patient follow-ups.

Progress:
Of the 666 referred, including 507 men (76%) and 159 females (24%), 211 (32%) veterans have been randomized to the study. We have met our recruitment goal of randomizing 211 veterans. As we have mentioned in previous reports, this is one of the largest psychotherapy trials for PTSD. Of the 211 randomized participants, 155 (73%) have completed therapy, and 56 (27%) have dropped out of therapy.

The 56 who dropped out included 6 who dropped out before their first therapy session due to scheduling conflicts, 8 who dropped out during therapy because of scheduling conflicts, 14 who stopped attending their sessions for unknown reasons and did not respond to phone calls and letters from study personnel, 15 who reported not feeling able to continue with the imaginal exposure component of treatment, 6 who cited personal problems interfering with participation, 3 who were terminated due to lack of attendance and treatment adherence, 1 who dropped out due to medical complications, 1 who had an unplanned move out of state, and 1 who dropped out after technological problems occurred during a session, and 1 dropped out due to lack of transportation.

Of the 211 who were randomized, 163 (77%) are men, and 48 (23%) are women. The racial/ethnic information for the 211 randomized veterans is as follows: 99 (49.7%) identify as Caucasian, 35 (17.6%) identify as African American, 38 (19.1%) identify as Hispanic/Latino, 27 (13.6%) identify as other.

Of the 666 referred, 223 (33%) were excluded from completing a phone screen. Of those excluded from a phone screen, 144 (65%) declined the screen, 38 (17%) were unavailable to schedule a screen, 39 (17%) were not ready clinically to begin the study, and 2 (1%) had other physical health concerns at the time of screen. Of those participants who completed a phone screen, 232 were excluded from randomization. Of those not randomized to the study, 108 (47%) declined additional assessment, 67 (29%) were unavailable to schedule, and 57 (25%) did not meet study criteria.

By design, the eligibility criteria for this project are broad so that findings will apply to most veterans with PTSD (different eras, different trauma types, etc.). We are pleased that we have a small rate of veterans excluded based on eligibility, and about half of the veterans screened for the study were randomized to treatment (a higher rate than many similar studies).

We have maintained approval for the study through the UCSD Human Research Protections Program, the VA Research and Development Subcommittee, and Karen Eaton, MS, at the Human Research Protection Office (HRPO), Office of Research Protections (ORP), United States Army Medical Research and Materiel Command (USAMRMC).

Again, the sample of 211 veterans we enrolled in our study represents one of the largest psychotherapy studies for PTSD ever conducted (see Bradley et al, 2005, for a meta-analysis and comparison of sample sizes). This large sample is sufficient to make several important contributions to the literature. See the Thorp et al. (2014) manuscript in the Appendices for study results.

The PI has been in frequent contact with other researchers in this area (e.g., Drs. Ron Acierno, Leslie Morland, Peter Shore, and Peter Tuerk) so that we can exchange best practices regarding PTSD assessment and treatment and the provision of services via videoconferencing. Our two publications on this topic (Backhaus et al., 2012 – Thorp is corresponding author; Thorp et al., 2012) continue to generate citations, reflecting their utility in this field. VA Central Office (VACO) asked the PI to participate on the Committee to Develop the Appendix to the VHA Telemental Health Operations Manual for Delivery of Evidence-Based Psychotherapy for PTSD. Additionally, through an invitation from VACO, the PI has been a member of the National Workgroup to Develop the VHA Workshop and Training Video for Delivery of Evidence-Based Psychotherapy for PTSD via Telemental Health. In a separate workgroup, we are developing an Internet-based training for providers who plan to deliver services for PTSD via Telemental Health. The PI is also on the Telemental Health Steering Committee at the San Diego VA, and our team has worked very closely with the San Diego VA clinical telemedicine team in an effort to educate clinicians about telemedicine. The PI attends the monthly meetings of this Committee to update telemedicine staff about our research progress and to exchange ideas (and conduct equipment troubleshooting) with the team. Our telemedicine research accounts for 30% of the telemedicine activity at the San Diego VA.

The PI was the Prolonged Exposure (PE) therapy consultant for the study therapists, and we had two consultation meetings each week to discuss cases. The PI co-signed each therapist's notes to monitor adherence to protocols and any safety issues, and he is one of only 16 VA PE Trainers nationally. In addition to facilitating 4-day trainings for VA clinicians, the PI consulted with clinicians nationally (listening to their therapy tapes and giving specific feedback) on cases each week to maintain his expertise in the treatment.

Key Research Accomplishments:

- There was demographic diversity in the sample. The age of participants ranged from 21 to 86 years. Approximately 24% of the participants were women. Slightly less than half of the sample were non-Hispanic Caucasians. No significant differences were found between treatment conditions on any of these characteristics.
- Nearly half of all potential subjects for the study were included, indicating good generalizability. Of 443 potential subjects who were formally screened on the telephone for eligibility, 211 (47.6%) were randomized to treatment in the study.
- Study attrition was low - nearly three quarters of the subjects completed treatment in each condition. Among those assigned to the IP condition, 72 of 99 participants (73%) completed treatment, and among those assigned to the VCP condition, 83 of 112 (74%) participants completed treatment.
- Analyses of CAPS scores at each follow-up time point indicated statistically significant and clinically significant reductions in PTSD severity scores with no significant effect for

treatment condition at any time point (see Table in Supporting Data, below). Thus, there were substantial improvements in PTSD symptoms in both VCP and IP.

- The Figure in Supporting Data, below, depicts mean differences in PTSD severity, rated on the CAPS, between treatment conditions. Improvement in PTSD severity scores in the VCP condition was not inferior to the improvement in the IP condition from baseline to post-treatment, but VCP was inferior to IP from baseline to follow-up.
- Thus, PE was effective at reducing PTSD severity in IP and VCP modalities, and therapists and clients appear satisfied with treatments in both modalities. However, the VCP modality was inferior to IP at the follow-up assessment with regard to PTSD severity and some health-related quality of life measures.

Reportable Outcomes:
Listed below are over 50 publications (all peer reviewed and invited), and, since 2008 (the year we received the notice of funding about this project), 75 presentations by the PI.

PUBLICATIONS

Peer-Reviewed Publications (* = Corresponding Author)

1. Wetherell, J. L., Palmer, B. W., **Thorp, S. R.,** Patterson, T. L., Golshan, S., & Jeste, D. V. (2003). Anxiety symptoms and quality of life in middle-aged and older outpatients with schizophrenia and schizoaffective disorder. *Journal of Clinical Psychiatry, 64,* 1476-1482. PMID: 14728110
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11. Ayers, C. R., Sorrell, J. T., **Thorp, S. R.**, & Wetherell, J. L. (2007). Evidenced-based treatments for late-life anxiety. *Psychology and Aging. 22,* 8-17. PMID: 17385978
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23. ***Thorp, S. R.,** Stein, M. B., Jeste, D. V., Patterson, T. L., & Wetherell, J. L. (2012). Prolonged exposure therapy for older veterans with posttraumatic stress disorder: Pilot study. *American Journal of Geriatric Psychiatry, 20,* 276-280. *Note: This paper was one of the top 10 most cited articles in the journal (AJGP) in 2012.*
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Invited Publications and Chapters (* = Corresponding Author)

1. ***Thorp, S. R.,** Gregg, J., Niccolls, R., & O'Donohue, W. T. (2001). The best and worst of times for behavioral mental health practice. In N. A. Cummings, V. M. Follette, S. C. Hayes, and W. T. O'Donohue (Eds.), *Integrated behavioral healthcare: Positioning mental health practice with medical/surgical practice.* San Diego, CA: Academic Press.
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(Eds.), *Cognitive behavior therapy with older adults: Innovations across care settings* (pp. 421-442). New York, NY: Springer Publishing Company.

12. **Thorp, S. R.** & Cook, J. M. (in press). Trauma and PTSD in older veterans. *Trauma Psychology News*, the newsletter published by Division 56 of the American Psychological Association (APA).
13. *Wells, S. Y., Williams, K., Walter, K., Moreno, L., Butler, E., Glassman, L. & **Thorp. S. R.** (accepted). Informed consent for providing services via clinical video. In P. Tuerk & P. Shore (Eds), *Behavioral Telehealth Series: Clinical Video Conferencing: Program Development and Practice*. New York, NY: Springer International.

Other Published Work (* = Corresponding Author)

1. O'Donohue, W. T., & **Thorp, S. R.** (1996, March). EMDR as marginal science. [Review of the Book *Eye Movement Desensitization and Reprocessing: Basic principles, protocols, and procedures*]. *The Scientist Practitioner, 5*(2), 17-19.
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3. ***Thorp, S. R.** (2004). [Review of the book *Bad therapy: Master therapists share their worst failures*]. *Journal of Psychosomatic Research, 57,* 115-116.
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6. Chambers, A., Eftekhari, A., Crowley, J., Ruzek, J., Gregory, G., Aosved, A., Castillo, D., **Thorp, S. R.**, Telfer, L., Kuhn, E., Foa, E. B., & Hembree, E. (2011). Strategies for recruiting veterans for PE. [Online slides for enhancing recruitment to therapy]. Available from all VA computers at: http://vaww.infoshare.va.gov/sites/pe/Lists/Useful%20Materials%20%20Information/AllItems.aspx?PageView=Shared
7. ***Thorp, S. R.,** Tuerk, P., & Eftekhari, A. (2011). Guidelines for PE via Telemental Health. [Online slides to guide prolonged exposure therapy via telemental health technology]. Available from all VA computers at: http://vaww.infoshare.va.gov/sites/pe/Lists/Useful%20Materials%20%20Information/AllItems.aspx?PageView=Shared
8. Acierno, R., Godleski, L., Karlin, B., Morland, L., Rauch, S., Smith, T., **Thorp, S. R.,** & Tuerk, P. (2011). Veterans Health Administration (VHA) Evidence-Based Psychotherapy for PTSD Telemental Health Appendix.
9. (Contributors, in Alphabetical Order): Christopher, M., Cohen, B., Cook, J., Cooley, S., Karel, M., Norman, S., **Thorp, S.,** & Vasterling, J. (2013). *FAQs about PTSD and dementia.*

Manuscripts Submitted for Publication (* = Corresponding Author)

1. Mørkved, N., Hartmann, K., Aarsheim, L. M., Holen, D., MIlde, A. M., Bomye, J., & **Thorp, S. R.** (2014). A comparison of narrative exposure therapy and prolonged exposure therapy for PTSD.
2. *Ross, B. S., Hurst, S., Agha, Z., Floto, E., Maglione, M., & **Thorp, S. R.** (2014). *Therapists' views of videoconferencing psychotherapy.* Manuscript submitted for publication.
3. Nappi, C. M., Staus, L. D., Norman, S. B., **Thorp, S. R.,** & Drummond, S. P. A. (2014). Recruitment and retention rates and the strategies used to promote them: Lessons learned from an OEF/OIF/OND prolonged exposure research trial. Manuscript submitted for publication.

Manuscripts In Preparation (* = Corresponding Author)

1. *Sones, H. M., Malcarne, V., & **Thorp, S. R.** (in preparation). *Measuring the positive outcomes of trauma: An empirical review of the psychometric properties of the Posttraumatic Growth Inventory.* Manuscript being revised for resubmission.
2. ***Thorp, S. R.,** Grimes, E., Allard, C. B., Norman, S. B., & Stein, M. B. (in preparation). *The role of mindfulness among women who have experienced intimate partner violence.*
3. *Sones, H. M., & Thorp, S. R. (in preparation). *The effect of maternal PTSD on children.*

Published Abstracts, Presentations, and Workshops (Since 2008)

1. Bormann, J., Hurst, S., **Thorp, S.,** Wetherell, J. L., & Golshan, S. (February 2008). *Mantram repetition practice to manage PTSD in veterans: A preliminary qualitative analysis.*VA HSR&D National Meeting, Baltimore, MD.
2. Rodgers, C. S., **Thorp, S.** & Agha, Z. (July 2008). *Veterans Telemedicine Outreach for PTSD Psychotherapy Services (VTOPS): Coding effective communication*. Poster session presented at the VA Office of Mental Health Conference (Continuing the Transformation of VA Mental Health Services: Bridging the Gaps), Alexandria, VA.
3. **Thorp, S. R.,** Norman, S. B., & Rodgers, C. S. (September 2008). *Empirically supported treatments for PTSD within the Veterans Administration.* Keynote Panel presented at the 13th International Conference on Violence, Abuse and Trauma (IVAT), San Diego, CA.
4. **Thorp, S. R.** (September 2008). *Exposure therapy for older veterans with PTSD.* Presented at the 13th International Conference on Violence, Abuse and Trauma (IVAT), San Diego, CA.
5. **Thorp, S. R.** (September 2008). *Introduction and overview: PTSD in older adults and veterans.* Lead presentation at the conference of the Senior Mental Health Partnership (NAMI and co-sponsors): Posttraumatic stress disorder in older adults and veterans, San Diego, CA.
6. **Thorp, S. R.,** Rodgers, C. S., & Schoenfeld-Smith, K. (October 2008). *When the troops come marching home: Addressing the needs of veterans.* Presented at the San Diego Psychological Association (SDPA) Fall Conference, San Diego, CA.
7. **Thorp, S. R.** (January 2009). *Treatment of Combat Veterans with PTSD*. Presented at the 23rd Annual San Diego International Conference on Child and Family Maltreatment, San Diego, CA.
8. **Thorp, S. R.** (February 2009). *Cognitive Behavioral Therapy with Older Adults*. Paper

presented at the West Coast Geriatric Psychiatry Conference, San Diego, CA.

9. Bormann, J.E., **Thorp, S.,** Wetherell, J.L., Golshan, S., Fellows, I., Lang, A., Gershwin, M., Kelly, A., Bone, P., & Belding, W. (February 2009). *Efficacy of a Spiritually-Based Mantram Intervention on Quality of Life in Veterans with Military-Related PTSD.* Poster presented at the Health Services Research and Development (HSR&D) National Meeting, Baltimore, MD.
10. **Thorp, S. R.** (March 2009). *Prolonged exposure therapy for older combat veterans.* Paper presented at the 29th Annual Meeting of the Anxiety Disorders Association of America (ADAA), Santa Fe, NM.
11. **Thorp, S. R.,** Nappi, C. A., Drummond, S. P. A., & McQuaid, J. M. (March 2009). *Imagery rehearsal therapy for nightmares in veterans.* Poster presented at the 29th Annual Meeting of the Anxiety Disorders Association of America (ADAA), Santa Fe, NM.
12. **Thorp, S. R.,** Bormann, J. E., Wetherell, J. L., Golshan, S., Gershwin, M., Kelly, A. (March 2009). *Effects of a spiritually-based mantram intervention on psychological distress in veterans with PTSD.* Paper presented at the 29th Annual Meeting of the Anxiety Disorders Association of America (ADAA), Santa Fe, NM.
13. Bormann, J., **Thorp, S.,** Gershwin, M., Kelly, A., & Glaser, D. (April 2009). *Spiritual well-being and PTSD symptoms in veterans: A predictive model.* Paper presented at the Society of Behavioral Medicine (SBM) Annual Meeting, Montreal, Canada.
14. Bormann, J. E., **Thorp, S.,** Gershwin, M., Kelly, A. & Glaser, D. (2009). *Spiritual well-being and PTSD symptoms in veterans: A predictive model. Annals of Behavioral Medicine (Suppl) 37,* S114.
15. **Thorp, S. R.,** & Eftekhari, A. (June 2009). *Prolonged Exposure Therapy Workshop*. Four-day training provided for VA Central Office, San Diego, CA.
16. Schuitevoerder, S., Dalenberg, C. J., & **Thorp, S. R.** (August 2009). *Evaluation of PTSD in elderly and cognitively impaired populations.* Paper presented at the 117th annual American Psychological Association (APA) national convention, Honolulu, HI
17. **Thorp, S. R.,** Raftery, J., Shah, N. H., Campbell, L. B., Agha, Z., & Fiedler, J. (September 2009). *Increasing number of unique veterans with access to telemental health services.* Poster presented at the VA San Diego Performance Improvement Fair, San Diego, CA.
18. **Thorp, S. R.** (September 2009). *Psychotherapy via telemedicine for post-traumatic stress disorder.* Paper and poster presented at the 3rd Military Health Research Forum, Kansas City, MO.
19. **Thorp, S. R.** (September 2009). *Treatment guidelines for different populations with PTSD.* Paper presented at the 14th International Conference on Violence, Abuse, and Trauma (IVAT), San Diego, CA.
20. Bormann, J., Hurst, S., **Thorp, S.** Schnack, J., Gershwin, M., Kelly, A., Becker, S., and Bone, P. (September 2009). *Spiritual mantram practice for managing hyperarousal in veterans with PTSD.* Paper presented at the 14th International Conference on Violence, Abuse, and Trauma (IVAT), San Diego, CA.
21. Hurst, S., Bormann, J., **Thorp, S.** Gershwin, M., Schnack, J., Spira, J., Kelly, A., Becker, S., and Bone, P. (September 2009). *Alternative approaches and techniques for dealing with post-traumatic stress disorder and traumatic brain injury in combat veterans.* Poster

presented at the 14th International Conference on Violence, Abuse, and Trauma (IVAT), San Diego, CA.

22. **Thorp, S. R.** (September 2009). *Delivering psychotherapy for PTSD via telemedicine.* Paper presented at the annual conference, Updates on Posttraumatic Stress Disorder (PTSD): Meeting the Challenges of the Uniform Mental Health Services Handbook , Palo Alto, CA.
23. **Thorp, S. R.** (September 2009). *Addressing PTSD among older veterans.* Paper presented at the annual conference, Updates on Posttraumatic Stress Disorder (PTSD): Meeting the Challenges of the Uniform Mental Health Services Handbook, Palo Alto, CA.
24. **Thorp, S. R.** (September 2009). *Posttraumatic stress disorder.* Paper presented at the University of California, San Diego (UCSD) Health and Wellness Lecture Series, San Diego, CA. Video of presentation available at: http://blink.ucsd.edu/technology/media/podcasts/blinkcast/HW/PTSD.html
25. **Thorp, S. R.** (September 2009). *Brief psychotherapy for military-related PTSD: Context and recommendations.* Paper presented at the Military Mental Health conference, San Diego, CA.
26. **Thorp, S. R.** (September 2009). *Current status and future directions of PTSD assessment and treatment.* Panel discussion at the conference: Healing the Hidden Wounds of War and Trauma: Understanding and Treating PTSD in the 21st Century, San Diego, CA.
27. Allard, C. B., Wansley, P., Grimes, E. M., Norman, S. B., **Thorp, S. R.,** & Stein, M. B. (November 2009). *The other side of the story: Characteristics of dropouts from a PTSD study*. Paper presented at the 25th Annual Meeting of the International Society for Traumatic Stress Studies (ISTSS), Atlanta, GA.
28. **Thorp, S. R.** (February 2010). *Cognitive Behavioral Therapy with Older Adults*. Paper presented at the West Coast Geriatric Psychiatry Conference, San Diego, CA.
29. Aupperle, R. L., Allard, C. B., Grimes, E. M., Simmons, A. N., Flagan, T., Cissell, S. H., **Thorp, S. R.,** Norman, S. B., Paulus, M. B., & Stein, M. B. (March 2010). *Neural systems dysfunction during anticipation in women with posttraumatic stress disorder related to intimate partner violence*. Paper presented at the 30th Annual Meeting of the Anxiety Disorders Association of America (ADAA), Baltimore, MD.
30. Bormann, J., Hurst, S., **Thorp, S.** & Glaser, D. (2010). Spiritually-based mantram repetition to manage PTSD in Veterans: A qualitative analysis of use and outcomes. [abstract].*Annuls of Behavioral Medicine (Supplement) 39*, s216.
31. Repp, A.L., **Thorp, S.R.,** Floto, E., Zuest, D.K., Ross, B.S., Moreno, L., Fidler, J., Madra, N., Zamora, T., Shah, N., & Agha, Z. (April 2010). *Cost analysis of cognitive behavioral and prolonged exposure therapy via telemedicine for treating posttraumatic stress disorder.* Paper presented at the VA Health Services Research & Development National Meeting, Little Rock, Arkansas.
32. Repp, A.L., **Thorp, S.R.,** Floto, E., Zuest, D.K., Ross, B.S., Moreno, L., Fidler, J., Madra, N., Zamora, T., Shah, N., & Agha, Z. (May 2010). *Treating veterans with PTSD via telemedicine is associated with reduced travel distance, time and costs.* Poster presented at the Veterans Health Administration Office of Telehealth Services National Telehealth Leadership Forum, St. Louis, Missouri.
33. Bormann, J. E., Hurst, S., **Thorp, S. R.,** Kelly, A. Bone, P., von Kaenel, L., Lang, A. (July 2010). *Application of a psycho-spiritual mantram intervention to manage PTSD*

symptoms in veterans: A qualitative analysis. Paper presented at the VA Office of Mental Health Services conference, Baltimore, MD.

34. Ross, B.S., Repp, A.L., Moreno, L., Fidler, J., Floto, E., Shah, N., Zamora, T., Madra, N., Hurst, S., Liu, L., Agha, Z. & **Thorp, S.R.** (August 2010). *Treating veterans with PTSD via telemedicine is associated with reduced travel distance, time and costs.* Paper presented at the 118th annual American Psychological Association (APA) national convention, San Diego, California.
35. Sones, H. M., **Thorp, S. R.,** Greene, C. J., Grubbs, K. M., & Morland, L. A. (August 2010). *Posttraumatic stress disorder in the military.* Paper presented at the 118th annual American Psychological Association (APA) national convention, San Diego, California.
36. Bormann, J. E., **Thorp, S. R.,** Wetherell, J.L. & Hurst, S. (August 2010). *Empirical Findings on the health benefits of mantram repetition: A portable contemplative practice.* Paper presented at the 118th annual American Psychological Association (APA) national convention, San Diego, California.
37. Stevens, J. M., Dahlin, K. M., Rivas, T. E., Priest, E. G., Lucas, C. M., Lightman, N. S., Toburen, L.,Castilli, M., Holloway, K., **Thorp, S. R.,** Dalenberg, C. J. (August 2010). *International and multicultural citation patterns and trends in the PTSD literature.* Paper presented at the 118th annual American Psychological Association (APA) national convention, San Diego, California.
38. Priest, E. G., Dahlin, K. M., Lucas, C. M., Stevens, J. M., Rivas, T. E., Lightman, N. S., Castilli, M., Alhassoon, O., **Thorp, S. R.,** Dalenberg, C. J. (August 2010). *Biologically-oriented publications in child and adult PTSD research: Emerging trends.* Paper presented at the 118th annual American Psychological Association (APA) national convention, San Diego, California.
39. Bormann, J. E., **Thorp, S. R.,** Liu, L., Wetherell, J.L. Glaser, D., & Lang, A. J. (August 2010). *Spiritual well-being mediates the effects of a psycho-spiritual mantram program on PTSD symptom severity in veterans with military-related PTSD.* Poster presented at the International Congress of Behavioral Medicine (ICBM), Washington, DC.
40. Bormann, J., **Thorp, S.,** Hurst, A., & Wetherell, J.L. (September 2010). *Mind-body spiritual complementary approach for managing symptoms of trauma in military veterans.* Paper presented at the 15th International Conference on Violence, Abuse and Trauma (IVAT), San Diego, CA.
41. Mackintosh, M., **Thorp, S. R.,** Sones, H. M., Hynes, A. K., Morland, L. A. (November 2010). *Cross-cultural psychometric properties of the Clinician-Administered PTSD Scale (CAPS) among mainland and Pacific Island combat veterans.* Paper presented at the 26th annual International Society for Traumatic Stress Studies (ISTSS) national convention, Montreal, Quebec, Canada.
42. **Thorp, S. R.,** Sones, H. M., & Wetherell, J. L. (November 2010). *Older veterans with PTSD: Is exposure therapy feasible?* Paper presented at the 44th annual Association for Behavioral and Cognitive Therapies (ABCT) convention, San Francisco, CA.
43. Moreno, L., Repp, A., Floto, E., Zuest, D.K., Ross, B.S., Fidler, J., Madra, N., Zamora, T., Shah, N., **Thorp, S.R.,** & Agha, Z. (November 2010). *Post traumatic stress disorder (PTSD) telemedicine study: The key to enrolling patients in cognitive processing and prolonged exposure therapies.* Poster presented at the 44th annual Association for Behavioral and Cognitive Therapies (ABCT) convention, San Francisco, CA.
44. **Thorp, S. R.,** & Tuerk, P. (November 2010). *Treatment of returning service members*

from Afghanistan and Iraq: Efforts to enhance treatment delivery and outcomes. Paper presented at the 44th annual Association for Behavioral and Cognitive Therapies (ABCT) convention, San Francisco, CA.

45. Floto, E. **Thorp, S.R.,** Zuest, D.K., Repp, A.L., Moreno, L., Fidler, J., Zamora, T., Ross, B.S., Shah, N., Madra, N., Roter, D., Laud, P., & Agha, Z. (November 2010). *Prolonged exposure therapy (PE) via telemedicine for the treatment of post-traumatic stress disorder (PTSD) in veterans.* Poster presented at the 44th annual Association for Behavioral and Cognitive Therapies (ABCT) convention, San Francisco, CA.
46. **Thorp, S.R.** (November 2010). Portrayal of an OEF-OIF Veteran with PTSD for *Prolonged Imaginal Exposure and Cognitive Processing Therapy* (Edna B. Foa and Patricia A. Resick, presenters). Presented at the 44th annual Association for Behavioral and Cognitive Therapies (ABCT) convention, San Francisco, CA.
47. Aupperle, R. L., Allard, C. B., Grimes, E. M., Simmons, A. N., Flagan, T., Cissell, S. H., **Thorp, S. R.,** Norman, S. B., Paulus, M. B., & Stein, M. B. (December 2010). *Unique influence of PTSD symptom clusters on neural activations during anticipatory processing*. Paper presented at the 49th Annual Meeting of the American College of Neuropsychopharmacology (ACNP), Miami Beach, FL.
48. **Thorp, S. R.** (February 2011). *Cognitive Behavioral Therapy with Older Adults*. Paper presented at the West Coast Geriatric Psychiatry Conference, San Diego, CA.
49. Zuest, D., Agha, Z., Floto, E., Fidler, J., Moreno, L., Barsotti, R., Repp, A., Ross, B., Zamora, T., Shah, N., & **Thorp, S.** (May 2011).Treatment avoidance in PTSD patients: Face-to-face versus telemedicine. Poster presented at the American Telemedicine Association 16th Annual International Meeting & Exposition in Tampa, Florida.
50. **Thorp, S. R.,** Wetherell, J.L. & Sones, H. M. (August 2011). *Psychotherapy for Older Combat Veterans with PTSD.* Paper presented at the 119th annual American Psychological Association (APA) national convention, Washington, D.C.
51. Acierno, R., Chard, K., Darkins, A., Frankenfeld, L., Friedman, M. J., Godleski, L., Greene, C., Johnston, R., Karlin, B., Morland, L. A., Shore, P., Smith, T. L., **Thorp, S. R.,** Tuerk, P. W., & Yoder, M. (September 2011). Providing evidence-based psychotherapies for PTSD via Telemental Health (TMH). All-day pre-conference workshop sponsored by the VA Office of Mental Health Services (OMHS) and the Office of Telehealth Services. 2011 OMHS National Conference, Baltimore, MD.
52. Gregory, A. M., Tirabassi, C., Allard, C. B., Twamley, E. W., Norman, S. B., **Thorp, S.,**. Stein, M. B. (September 2011). *Cognitive performance and treatment response in women with PTSD.* Paper presented at the 16th International Conference on Violence, Abuse and Trauma (IVAT), San Diego, CA.
53. **Thorp, S.,** Fridley, D., & Ross, I. (September 2011). *PTSD: One type doesn't fit all.* Panel discussion at the 16th International Conference on Violence, Abuse and Trauma (IVAT), San Diego, CA.
54. Aupperle, R. L., Allard, C. B., Grimes, E. M., Simmons, A. N., Flagan, T., Cissell, S. H., **Thorp, S. R.,** Norman, S. B., Paulus, M. B., & Stein, M. B. (November 2011). *Executive function in PTSD: Relationship to neural responses during affective anticipation.* Paper presented at the 27th Annual Meeting of the International Society for Traumatic Stress Studies (ISTSS), Baltimore, MD.
55. Allard, C. B., Norman, S. B., **Thorp, S. R.,** & Stein, M. B. (November 2011). *Outcomes and correlates of a specialized cognitive trauma therapy for IPV victims.* Paper presented

at the 27th Annual Meeting of the International Society for Traumatic Stress Studies (ISTSS), Baltimore, MD.

56. **Thorp, S. R.** (November 2011). *Psychotherapies for older military veterans with PTSD.* Annual Meeting of the International College of Geriatric Psychoneuropharmacology (ICGP), Irvine, CA.
57. **Thorp, S. R.** (January 2012). *The future of clinical training in psychology: How technology matters.* Paper presented at the Council of University Directors of Clinical Psychology Midwinter Meeting, San Diego, CA.
58. Tuerk, P.W. & **Thorp, S. R.** (February 2012). *Providing prolonged exposure for PTSD via telemental health.* Invited presentation to the VISN 11 PTSD Mentors group.
59. Silberg, J., **Thorp, S. R.,** Caplan, P., Carlton, T., & Nacev, V. (September 2012). *Developmental, complex, and post-traumatic stress disorder: Controversial issues in labeling and intervention.* Panel discussion at the 17th International Conference on Violence, Abuse and Trauma (IVAT), San Diego, CA.
60. Morland, L. A., **Thorp, S. R.,** & Acierno, R. (November 2012). *Home-based clinical video-teleconferencing for PTSD: A patient centered model.* Paper presented at the 28th Annual Meeting of the International Society for Traumatic Stress Studies (ISTSS), Los Angeles, CA.
61. Sones, H. M., Moreno, L., Schuitevoerder, S., Fidler, J., Agha, Z., & **Thorp, S. R.** (November 2012). *The impact of trauma-related guilt and cognitive appraisal on posttraumatic growth in Veterans with PTSD.* Poster presented at the 65th annual Gerontological Society of America meeting, San Diego, CA
62. Gregory, A.M., Tirabassi, C., Allard, C.B., Norman, S.B., **Thorp, S.,** Stein, M.B., & Twamley, E.W. (2013). Cognitive performance and treatment response in women with PTSD. *Journal of the International Neuropsychological Society, 19 (S1),* 173. (International Neuropsychological Society).
63. **Thorp, S. R.** (February 2013). *Cognitive Behavioral Therapy with Older Adults*. Paper presented at the West Coast Geriatric Psychiatry Conference, San Diego, CA.
64. Langley-DeGroot, M., Sones, H. M., & **Thorp, S. R.** (March 2013). Self-report versus clinician-assigned PTSD symptom ratings in a sample of older male veterans. Poster presented at the 26th annual meeting of the American Association for Geriatric Psychiatry (AAGP), Los Angeles, CA.
65. **Thorp, S. R.** (March 2013). Exposure therapy for older veterans with PTSD. Paper presented at the 26th annual meeting of the American Association for Geriatric Psychiatry (AAGP), Los Angeles, CA.
66. Bormann, J. E., & **Thorp, S.** (March 2013). *Portable Mantram Repetition improves spiritual wellbeing in veterans with PTSD.* Paper presented at the 34th annual Meeting & Scientific Sessions of the Society of Behavioral Medicine, San Francisco, CA.
67. Bormann, J. E., & **Thorp, S.** (March 2013). *Portable Mantram Repetition improves spiritual wellbeing in veterans with PTSD* (abstract). *Annuls of Behavioral Medicine*, 45, Supp2, s181.
68. **Thorp, S. R.,** Agha, Z., Moreno, L., & Liu, L. (April 2013). *Videoconferencing psychotherapy for military veterans with PTSD.* Paper presented at the 33rd Annual Meeting of the Anxiety Disorders Association of America (ADAA), La Jolla, CA.
69. Moreno, L., **Thorp, S. R.,** Agha, Z., & Liu, L. (April 2013). *Treatment satisfaction and alliance with posttraumatic stress disorder (PTSD) telemedicine psychotherapy for*

military veterans. Paper presented at the 33rd Annual Meeting of the Anxiety Disorders Association of America (ADAA), La Jolla, CA.

70. **Thorp, S. R.,** Sones, H. M. (April 2013). *Prolonged exposure vs. relaxation for older veterans with PTSD*. Paper presented at the 33rd Annual Meeting of the Anxiety Disorders Association of America (ADAA), La Jolla, CA.
71. Repp, A. L., **Thorp, S. R.,** & Agha, Z. (April 2013). *Video telemedicine offers significant savings in distance, time and travel costs for veterans with posttraumatic stress disorder*. Poster presented at the 33rd Annual Meeting of the Anxiety Disorders Association of America (ADAA), La Jolla, CA.
72. **Thorp, S. R.** (April 2013). *Implementing Internet-mediated exposure therapy for various anxiety disorders: Research findings and clinical considerations*. Discussant for symposium presented at the 33rd Annual Meeting of the Anxiety Disorders Association of America (ADAA), La Jolla, CA.
73. Robertson, A., Lincoln, A., Agha, Z., & **Thorp, S. R.** (April 2013). *Utility elicitation of PTSD specific health-related quality-of-life*. Poster presented at the 33rd Annual Meeting of the Anxiety Disorders Association of America (ADAA), La Jolla, CA.
74. **Thorp, S. R.** *Cognitive Processing Therapy for veterans via video teleconferencing.* (August 2013). Paper presented at the 120th annual American Psychological Association (APA) national convention, Honolulu, HI.
75. **Thorp, S. R.,** & Williams, K. E. (October 2013). *VA Connects: Telemental Health Regional Center*. Paper presented at the 2013 National Association of Academic Psychiatry Administrators (NAAPA) Fall Education Meeting. San Diego, CA.

The PI also continues to give local talks to increase awareness of PTSD and psychotherapy via teleconferencing (sample of talks since 2012):

1. March 20, 2012 for 40 attendees at SDSU Research Foundation: "PTSD and Comorbidities"
2. April 12, 2012 for 175 students in Careers in Psychology course at SDSU: "Clinical Research Careers and PTSD Research."
3. May 3, 2012 for 50 mental health professionals and trainees in San Diego: "Lessons Learned in Providing Psychotherapy for PTSD via Teleconferencing."
4. September 21 and 28, 2012 for 15 attendees at the PTSD Seminar in VA Healthcare System: "Prolonged Exposure Therapy Overview."
5. December 10, 2012 for 75 attendees on national LiveMeeting for VA: "Prolonged Exposure via Telemedicine."
6. December 14, 2012 for 10 attendees at Grossmont Community College Life Coach Seminar: "PTSD Assessment, Treatment, and Resources."
7. January 10, 2013 for 100 attendees at Grand Rounds for Psychiatry Department at the UCSD School of Medicine: "Posttraumatic Stress and Growth in Older Adults."
8. January 15, 2013 for 20 attendees at Grand Rounds for the Stein Institute for Research on Aging (SIRA): "Posttraumatic Stress and Growth in Older Adults."
9. January 30, 2013 for 360 attendees at Congregation Beth Israel Jewish Family Service: "Therapeutic Options for Treating Trauma-Related Symptoms."
10. February 7, 2013 for 45 attendees at VA national LiveMeeting for Community Living Center (nursing home) providers: "PTSD in Later Life"
11. February 14, 2013 for 40 attendees at VA national LiveMeeting for Home-Based Primary

Care providers: "Conducting Prolonged Exposure for PTSD with Older Adults and in Home Settings"
12. March 5, 2013 and March 19, 2013 for 40 mental health professionals in the community: "Cognitive Behavioral Therapy Skills Training" (12 hour course)
13. March 12, 2013 for 125 undergraduate students in PSY124 course at UCSD: "Cognitive Behavioral Therapy"
14. May 13, 2013 for 100 staff and Veterans at VA for Research Week Symposium: "Telemedicine for Veterans with PTSD."
15. May 21, 2013 for 450 providers in VA Healthcare System (PTSD Consultation Seminar conference call): "PTSD and Dementia" (with Jennifer Vasterling): http://vaww.ptsd.va.gov/Training.asp
16. May 21, 2013 for 15 attendees: "CBT Group Consultation"
17. June 11, 2013 for 40 attendees: "PTSD: Research and Clinical Applications" (member of panel)
18. June 19, 2013 for 30 attendees of Stein Public Lecture Series: "Posttraumatic Stress and Growth in Older Adults."
19. September 18, 2013 for 25 attendees for the Geriatric Research, Education, and Clinical Center (GRECC) and the VA Palo Alto Psychology Service, VA Geriatric Scholars Program for Psychologists: "PTSD in Older Adults" (via videoconference)
20. November 1, 2013 for Veterans Medical Research Foundation Board of Directors: "Videoconferencing Psychotherapy for Veterans with PTSD."
21. February 4, 2014 for 20 attendees at the Mental Health CORE meeting: “The History and Evolution of PTSD Clinics in San Diego.”
22. February 27, 2014 for 15 attendees at the Stein Institute for Research on Aging (UCSD) Research Meeting: “The Online SAGE Survey of Community Older Adults: PTSD, Posttraumatic Growth, and Mindfulness.”
23. March 11, 2014 for 10 attendees at VA VISN 22 Clinical Services Council: “VA Connects: The Telemental Health Regional Center.”
24. March 19, 2014 for 575 attendees the National Center for PTSD Consultation Program: “Assessment and Treatment of PTSD in Older Adults”

The PI additionally continues to participate in local and national workgroups on psychotherapy for PTSD, telemedicine, and related topics.

The PI has also been asked to update the media about this work on several occasions:

MEDIA COVERAGE

Nierengarten, M. B., journalist for *Medscape Medical News*. (April 2009). ADAA 2009: Exposure therapy for PTSD may benefit older veterans: Pilot study results show promise. Online: http://www.medscape.com/viewarticle/589792

MacNeil, J. S., journalist for *Caring for the Ages*. (November 2009). PTSD research reaches older veterans. Online: http://download.journals.elsevierhealth.com/pdfs/journals/1526-4114/PIIS1526411409603139.pdf

Television news interview - *CW Channel 6* (March 21, 2010). Posttraumatic stress disorder (interview with Dr. Thorp and discussion of PTSD studies).

Kovach, G. C., journalist for *The Union Tribune (newspaper)*. (April 10, 2010). Susceptibility to PTSD focus of conference: Why do some suffer it, while others don't? Online: http://www.signonsandiego.com/news/2010/apr/10/susceptibility-to-ptsd-focus-of-conference/

The following article was chosen as the Research Article of the Day (July 25, 2012) by *The Practice Institute*: http://thepracticeinstitute.com/publications-and-products/article-resource-library/research-article-of-the-day

Backhaus, A., Agha, Z., Maglione, M. L., Repp, A., Ross, B., Zuest, D., Rice-Thorp, N. M., Lohr, J., & **Thorp, S. R.** (Thorp is corresponding author). (2012). Videoconferencing psychotherapy: A systematic review. *Psychological Services, 9*, 111-131.

The following article was highlighted in *VA Research Currents* (March/April 2012): http://www.research.va.gov/currents/mar-apr12/mar-apr12-02.cfm

Bormann, J. E., **Thorp, S. R.,** Wetherell, J. L., Golshan, S. & Lang, A. J. (in press). Meditation-based mantram intervention for veterans with posttraumatic stress disorder: A randomized trial. *Psychological Trauma: Theory, Research, Practice, and Policy*.

Radio interview with Rick Rogers (August 12, 2012): *Front & Center: Military Talk Radio*. http://defensetracker.com/web/?p=2691

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Schuitevoerder, S., Rosen, J. W., Twamley, E. W., Ayers, C. R., Sones, H., Lohr, J. B., Goetter, E. M., Fonzo, G. A., Holloway, K. J., & **Thorp, S. R.** (in press). A meta-analysis of cognitive functioning in older adults with PTSD. *Journal of Anxiety Disorders*. doi:10.1016/j.janxdis.2013.01.001

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http://newoldage.blogs.nytimes.com/2013/03/15/no-end-to-trauma-for-some-older-veterans/

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Steele, J., journalist for *The San Diego Union Tribune* (May 5, 2013): Face-to-Face with PTSD. Online: http://www.utsandiego.com/news/2013/may/05/tp-face-to-face-with-ptsd/?page=1#article-copy

Perry, T., journalist for the *L.A. Times* (July 4, 2013): Skype therapy? It's working for veterans. Online: http://www.latimes.com/news/local/la-me-ptsd-skype-20130705,0,3029520.story

Mento, T., journalist for KPBS Television and KPBS Radio News (August 12, 2013): Telehealth Counseling Makes PTSD Treatment Accessible for Veterans. Online: http://www.kpbs.org/news/2013/aug/12/telehealth-counseling-makes-ptsd-treatment-accessi/

Participant in the VA's AboutFace program, a website designed to decrease stigma associated with PTSD and PTSD treatment: http://www.ptsd.va.gov/apps/AboutFace/clinician_questions.html

Conclusion:
We have demonstrated good progress during the project, including meeting the targeted sample size (planned for n = 210, randomized n = 211). The PI has become recognized as an expert in psychotherapy via telemedicine through publicly disseminating data and lessons learned from this and other projects. We believe that this project will add greatly to our knowledge about how best to provide psychotherapy to veterans with PTSD at remote locations. We are currently working on manuscripts (including Thorp et al., 2014, in the Appendices) so that we can disseminate results to the field of psychology and telemental health.

References:

Bradley, R., Greene, J., Russ, E., Dutra, L., Westen, D. (2005). A multidimensional meta-analysis of psychotherapy for PTSD. *American Journal of Psychiatry, 162,* 214-227.

Supporting Data:

See Table and Figure below. Improvement in PTSD severity scores in the VCP condition was not inferior to the improvement in the IP condition from baseline to post-treatment [p = 0.003; difference = 0.09 per week; 95% confidence interval (-0.364, 0.543, non-inferiority (NI) margin 0.718], but VCP was inferior to IP from baseline to follow-up [p = 0.043; difference = 0.074 per week; 95% confidence interval (-0.163, 0.311, NI margin 0.281].

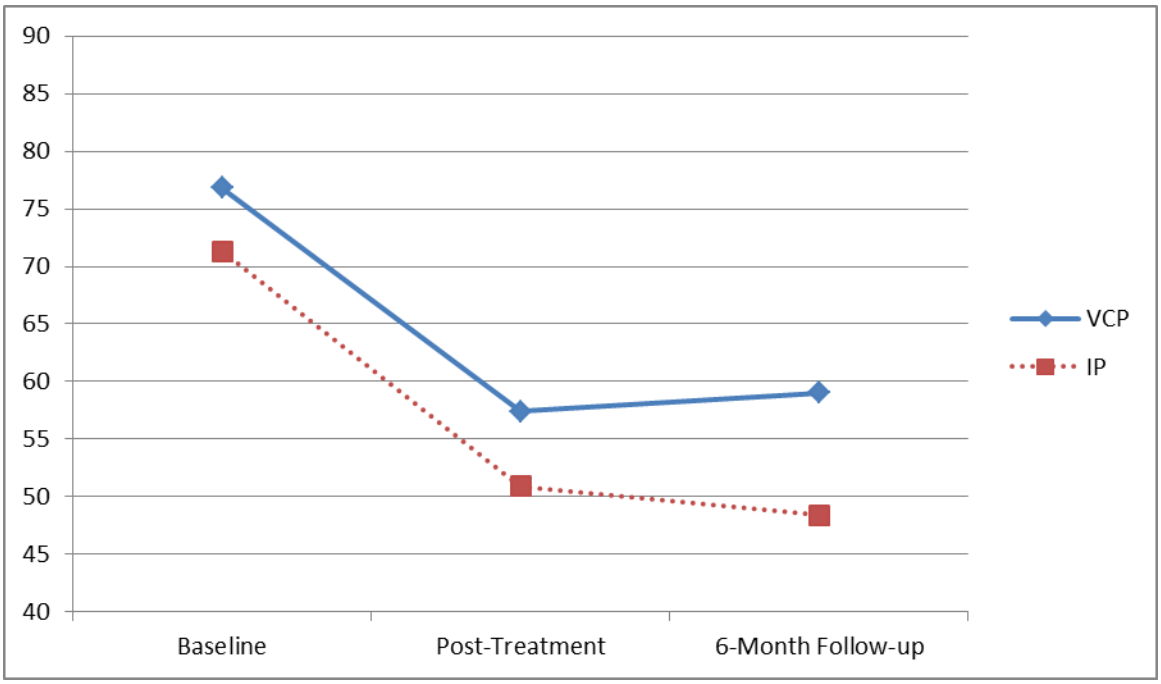
Table: PTSD Severity Scores[a]

Time Point	Condition	*n*	*M (SD)*	*p*
Baseline	IP	99	71.7 (17.1)	n/a
	VCP	112	76.8 (18.3)	
	All	211	74.4 (17.9)	
Post-Treatment	IP	69	50.9 (26.3)	.81[b]
	VCP	81	57.4 (28.7)	
	All	150	54.4 (27.7)	
6-Month Follow-up	IP	44	48.4 (28.8)	.64[c]
	VCP	51	59.0 (31.02)	
	All	95	54.1 (30.3)	

Note. PTSD = posttraumatic stress disorder; IP = in person; VCP = videoconferencing psychotherapy.

[a]PTSD severity scores from the Clinician-Administered PTSD Scale. [b]*p* values are for change score difference between conditions from baseline to post-treatment. [c]*p* values are for change score difference between conditions from baseline to 6-month follow-up.

Figure: Mean Clinician-Administered PTSD Scale Scores



Note. VCP = videoconferencing psychotherapy; IP = in person. The intent-to-treat sample (N =211) was used for all analyses. A decrease of 15 points on the CAPS is considered clinically significant.

Appendices:

Note: Thorp is corresponding author on each of these publications.

Thorp, S. R., Fidler, J., Moreno, L., Floto, E., & Agha, Z. (2012). Lessons learned from studies of psychotherapy for PTSD via video teleconferencing. *Psychological Services, 9,* 197-199.

Backhaus, A., Agha, Z., Maglione, M. L., Repp, A., Ross, B., Zuest, D., Rice-Thorp, N. M., Lohr, J., & **Thorp, S. R.** (2012). Videoconferencing psychotherapy: A systematic review. *Psychological Services, 9,* 111-131.

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Lessons Learned From Studies of Psychotherapy for Posttraumatic Stress Disorder Via Video Teleconferencing

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This article summarizes two ongoing randomized controlled trials that compare individual in-person psychotherapy with psychotherapy provided using video teleconferencing for military veterans with posttraumatic stress disorder. We describe training methods, populations, technology, challenges, successes, and lessons learned so far during the trials.

Keywords: telehealth, telemental health, telemedicine, videoconference, psychotherapy

Names of Institutions

The VA San Diego Healthcare System and the University of California, San Diego.

Services Delivered

Studies of psychotherapy for posttraumatic stress disorder (PTSD) in veterans using video teleconferencing (VTC).

Type of Professionals Involved

Twenty-five psychotherapists (doctoral students in psychology and psychologists, social workers, and marriage and family therapists) as well as master's level assistants.

Training for Telemental Services

Study assistants first spoke with experts and reviewed documents detailing VTC recommendations. Assistants reassured veterans that the VTC connection was secure, they reviewed possible visual and audio issues that might arise during sessions, and, before they left the therapy room, they showed veterans where they would sit if they were needed during the session.

Populations Served

We are conducting two ongoing randomized controlled trials that compare psychotherapy using VTC with in-person psychotherapy for veterans with PTSD. In one study, all veterans receive cognitive processing therapy (CPT), which teaches the patient how to monitor and challenge maladaptive thoughts. In the other study, all veterans receive prolonged exposure therapy (PE), which helps the patient repeatedly face feared (but safe) memories and situations. In the CPT study, we have screened 426 veterans and 196 have been randomized to date. The

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median age is 49 years (range: 22−84), and 22% are women. Worst identified traumas include combat (45%), sexual assault (19%), accident (10%), or other (26%). In addition to PTSD, 58% had co-occurring mood disorders and 21% had at least one other anxiety disorder. In the PE study, we have screened 284 veterans and 132 have been randomized. The median age is 55 years (range: 23−79), and 18% are women. Worst identified traumas include combat (52%), sexual assault (18%), accident (11%), or other (19%). In addition to PTSD, 72% had co-occurring mood disorders and 15% had at least one other anxiety disorder.

Geographic Location Served

San Diego County, California.

Funding Sources

U.S. Department of Veterans Affairs (CPT study) and the U.S. Department of Defense (PE study).

Technology Used

We have used Tandberg 550 and LifeSize Focus video conferencing systems. We have found these systems to be reliable and user friendly. For quality control, we record all VTC sessions using a digital video recorder, and these recordings are stored on our secure VA server. We use fax machines to relay questionnaires between veterans and therapists. In the PE study, we use laptops to play videos, and veterans use digital audio recorders.

Technology Choices That Would Be Different Next Time and Why

None.

Use of Electronic Medical Record

We use an electronic medical record—the Computerized Patient Record System—to document all clinical services in the VA. When veterans are assigned to VTC, we add a system note that they have agreed to this mode of treatment.

Biggest Challenges

Challenges in conducting VTC included visual artifacts (pixilation, "tracer" images with movement, occasional low image resolution, "choppy" or "frozen" images) and audio artifacts (delay, echo, "mechanical" voices). Our equipment shows veterans from the torso. In one instance, a therapist did not realize her veteran was in a wheelchair until the third therapy and the therapist discovered that the veteran's wife had assisted him during all assigned homework activities. Thus, the wheelchair and the wife's assistance had impacted the veteran's assignments without the therapist's awareness. Fidgeting hands and feet can also be missed. Another therapist could not tell whether a veteran was sniffling due to a cold or to tears. Physical contact, like shaking hands and handing tissues to a sobbing client, is not possible in VTC.

Biggest Successes

Our veterans have expressed satisfaction with the decreased travel time, cost savings related to purchasing less gasoline, and fewer crowds and parking problems at the remote sites. Both veterans and therapists have been patient with the technology, and several have reported enjoying (even preferring) VTC sessions.

Lessons Learned

We have learned how proper orientation to equipment and administrative support at each site can put both therapists and veterans at ease. We have provided therapists with phone numbers and physical addresses for the veterans and study assistants at remote sites to help manage potential crises (to direct emergency personnel). We have learned to use a blue screen backdrop at each site, good lighting, and enough distance from the camera (with zoomed lens) to allow for the perception of eye contact. Heavy chairs minimize off-screen movement. We have learned to systematically monitor call quality to adjust the bandwidth needed, and that rebooting the equipment solves many problems. Some veterans have reported heightened concerns about the security of the video transmissions, and some have been wary of other people, noises, or items in the therapist's room. Others have expressed a preference for the remote nature of VTC because they could "lower

[their] guard." Therapists have reported good rapport, despite the fact that they do not meet veterans in person before starting treatment using VTC. Several therapists have expressed a preference for VTC when veterans are physically intimidating or have contagious illnesses. Therapists have also mentioned that it is easier to end sessions on time in VTC because the discussion is more focused and the equipment is turned off at the designated end time.

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Videoconferencing Psychotherapy: A Systematic Review

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Individuals with mental health problems may face barriers to accessing effective psychotherapies. Videoconferencing technology, which allows audio and video information to be shared concurrently across geographical distances, offers an alternative that may improve access. We conducted a systematic literature review of the use of videoconferencing psychotherapy (VCP), designed to address 10 specific questions, including therapeutic types/formats that have been implemented, the populations with which VCP is being used, the number and types of publications related to VCP, and available satisfaction, feasibility, and outcome data related to VCP. After electronic searches and reviews of reference lists, 821 potential articles were identified, and 65 were selected for inclusion. The results indicate that VCP is feasible, has been used in a variety of therapeutic formats and with diverse populations, is generally associated with good user satisfaction, and is found to have similar clinical outcomes to traditional face-to-face psychotherapy. Although the number of articles being published on VCP has increased in recent years, there remains a need for additional large-scale clinical trials to further assess the efficacy and effectiveness of VCP.

Keywords: telehealth, telemental health, telemedicine, videoconference, psychotherapy

One out of every four adults in the United States meets criteria for a mental disorder (WHO World Mental Health Survey Consortium, 2004), but only 13.4% of adults in the U.S. receive mental health treatment (National Institute of Mental Health, 2011). Many types

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of psychotherapies have been demonstrated to be effective in treating mental disorders, yet practical and psychological factors often prevent patients from receiving mental health care (Olden, Cukor, Rizzo, Rothbaum, & Difede, 2010). One such factor is the location in which mental health services are available. In the United States, 77% of the counties have a severe shortage of mental health professionals (Thomas, Konrad, Holzen, & Morrissey, 2009). Another factor is that relatively few providers are trained in the therapies with the greatest empirical support (Shapiro, Cavanagh, & Lomas, 2003; Van den Berg, Shapiro, Bickerstaffe, & Cavanagh, 2004), and most of those trained specialists reside in metropolitan areas (Wallace, Weeks, Wang, Lee, & Kazis, 2006). This can greatly limit access to care for individuals living in rural areas.

Many individuals do not have the means to travel great distances to seek specialized mental health services, and this problem is compounded during times of economic crisis or high fuel prices. In addition, the nature of many mental disorders leads patients to avoid anxiety-provoking situations such as large groups of people (e.g., urban centers, hospitals) and traveling on roads (e.g., driving phobias after accidents or roadside bomb attacks). Individuals may be more inclined to seek treatment in familiar and convenient community clinics or from the comfort of their homes if those options are available to them.

Telehealth refers to the use of technology to provide health care when providers are geographically distant from patients (Field, 1996; Schopp, Demiris, & Glueckauf, 2006). Many mental health professionals use information technology such as telephones, e-mail, and web forums to communicate with patients. Advanced technology (e.g., computers, smart phones, virtual reality), including videoconference (VC) technology, may further enhance access to mental health treatment. The VA Health Care System has responded to the need for rural services for Veterans in part by developing outpatient clinics and Vet Centers in more sparsely populated areas, but the VA has also emerged as one of the largest providers of telehealth. In fiscal year 2007, there were over 45,000 visits for mental health services by telehealth ("telemental health") in the VA system (Godleski, Nieves, Darkins, & Lehmann, 2008). Reflecting the high volume of clinical visits via telemental health in recent years, the number of publications on telemental health from 2000 to 2008 was more than triple the number of publications from the previous 30 years (Richardson et al., 2009). However, there appears to be a need for more empirical, rather than descriptive, articles.

Videoconferencing psychotherapy (VCP) is one type of telehealth that can offer patients improved access to mental health professionals with specialized expertise (Mair & Whitten, 2000). We conducted the current review because, despite the surge in publications, no reviews (to our knowledge) have focused solely on psychotherapy via videoconferencing. Many different terms have been used when describing psychotherapy in this format, and we aimed to describe those terms while synthesizing the literature. Furthermore, it has not been clear whether articles have been primarily descriptive or empirical. Because of the expanding literature on this topic and the recent publication of several excellent clinical trials, we saw a need for a specific and updated review. We chose to perform a systematic review because our aim was to conduct a thorough review of the available literature, according to a predetermined protocol, in order to address very specific research questions (Centre for Reviews and Dissemination, 2009; Kitchenham, 2004). Consistent with the goals in conducting a systematic review, we focused on "identifying, appraising and synthesizing research-based evidence and presenting [it] in an accessible format . . . from which conclusions can be drawn and decisions made" (Higgins & Green, 2011, para. 1.2.1–1.2.2). The review protocol includes specific search strategies, including the use of strict inclusion and exclusion criteria for each study. We followed a systematic review protocol to identify strengths and gaps in the literature, to provide empirically derived conclusions, and to offer suggestions for future studies.

We posed 10 specific questions related to the research available on VCP. Among *all* of the articles that met our inclusion criteria, we sought to answer:

1. What are the types of articles published and what is the relative frequency of each type of article?
2. What are the publication rates over time for empirical and nonempirical articles?

3. To guide future reviews, what are the common terms used in the literature to describe live remote psychotherapy via videoconferencing and traditional, in-person psychotherapy?

From the included *empirical* articles, we sought to answer:

4. What formats and types of psychotherapy have been conducted via videoconferencing?
5. Which populations have been studied?
6. What are the primary assessment instruments that have been used?
7. Is VCP feasible? That is, can it be implemented successfully in different formats, with different populations, and using different types of therapy? Moreover, can emotions be conveyed through VC, and are costs manageable?
8. Are there differences in the therapeutic relationship when psychotherapy is delivered via teleconferencing rather than in person?
9. Are providers and consumers satisfied with VCP?
10. Are the clinical outcome data for VCP comparable to in-person psychotherapy?

Method

Search Strategy

To identify eligible articles, we searched the PubMed, PsycINFO, and PILOTS electronic search engines. Ten different search combinations were used. We began by combining the terms "psychotherapy" and "telemedicine." Next, we combined each of the terms "mental health," "therapy," and "psychotherapy" with the terms "video and telehealth," "video and telemedicine," and "teleconferencing" (nine additional searches). We conducted the searches on January 27, 2011. We screened all titles and abstracts, and we obtained complete reports for the articles that appeared eligible for inclusion. We examined the reference lists of obtained articles for potentially appropriate articles that may have been missed in the electronic searches.

Selection Criteria

We established three inclusion criteria: (a) published in English language, (b) published in peer-reviewed journals, and (c) focused on live VCP (i.e., through specialized video telehealth equipment, video phones, or computer monitors). We excluded: (a) search engine results lacking an abstract (including letters to the editor); (b) articles that were focused on psychiatric services other than psychotherapy (e.g., assessment; consultation, medication management in combination with psychotherapeutic support); (c) dissertations; (d) nonvideo telephone interventions (e.g., telephone conference call group therapy); (e) nonvideo computer interventions (e.g., online psychoeducation); (f) self-administered interventions; (g) e-mail interventions; or (h) video therapy that was not live (e.g., review of recordings). For the nonempirical articles, we allowed literature reviews that were not solely focused on VCP (since we were aware of none which did so) but had a significant discussion of VCP issues. For empirical articles, we required that at least one of the following outcomes was reported: therapeutic relationship, satisfaction, clinical outcome data, or feasibility. Eligibility of articles based on these criteria was determined by a consensus of all authors.

Classification

Analysis of all articles. In answering research Questions 1–3, all 65 articles were analyzed. For Question 1, we classified the types of articles as either nonempirical or empirical. We divided the nonempirical articles into two subcategories: (a) reviews of the literature, or (b) descriptions of particular programs. We divided the empirical articles into three subcategories: (a) uncontrolled studies (encompassing case studies, case series, and cross-sectional surveys); (b) controlled, nonrandomized studies; or (c) randomized controlled trials (RCTs). To address Question 2, we created bar graphs of the nonempirical and empirical articles and visually inspected them for patterns. For Question 3, we examined each included article by hand to identify the most frequently used terms in each article to describe the two modes of treatment (remote video technology and traditional in-person therapy).

Analysis of empirical articles. Analysis for research Questions 4–10 included empirical studies only. The 47 empirical studies and their sample sizes can be seen in Table 1. Prior to answering questions four through 10 we attempted to determine whether different empirical articles were reporting on the same data set, through examining the articles or contacting the authors. We discovered that 10 of the empirical articles represented five pairs of studies which had overlapping samples (Bouchard et al., 2004 and Bouchard et al., 2000; Frueh et al., 2007 and Frueh et al., 2007; Germain, Marchand, Bouchard, Drouin, & Guay, 2009 and Germain, Marchand, Bouchard, Guay, & Drouin, 2010; Marrone, Mitchell, Crosby, Wonderlich, & Jollie-Trottier, 2009 and Mitchell et al., 2008; Morland et al., 2010 and Greene et al., 2010). For the articles with overlapping samples, we chose only to include the data from the article with the largest sample size (if one was larger), and thus, included five of these articles. The five excluded articles are noted in Table 1 with an asterisk (*).

For Questions 4–6, we determined percentages based on the total number of samples (rather than articles) to avoid double-counting, and thus analyzed only the 42 unique samples for those topics (i.e., populations studied, format and types of psychotherapy, assessments used). For Question 4, we classified the psychotherapy format (individual, group, family, couples, mixed, undefined) and type (cognitive–behavioral therapy [CBT], family therapy, substance abuse therapy, eclectic or undefined, or other defined therapy). For Question 5, we classified the empirical samples by psychiatric diagnoses, military status (active duty, Veteran, or civilian), and developmental status (child/adolescent, general adult, or older adult). For Question 6, we hand-searched each empirical article for individual instruments and classified

Table 1
Empirical Studies

Uncontrolled studies		Nonrandomized controlled studies		Randomized controlled studies	
Author(s)	N	Author(s)	N	Author(s)	N
Bakke et al., 2001	2	Bouchard et al., 2004	21	Day & Schneider, 2002	80
Bischoff et al., 2004	3	Cluver et al., 2005	10	Frueh, Monnier, Yim et al., 2007	38
Bose et al., 2001	13	Germain et al., 2009	48	*Frueh, Monnier, Grubaugh et al., 2007	38
*Bouchard et al., 2000	8	*Germain et al., 2010	46	Glueckauf et al., 2002	27
Cowain, 2001	1	Grady & Melcer, 2005	112	*Greene et al., 2010	112
Deitsch, et al., 2000	4	Harvey-Berino, 1998	166	King et al., 2009	37
Earles et al., 2001	3	Morgan et al., 2008	86	*Marrone et al., 2009	116
Frueh et al., 2005	18	Simpson et al., 2006	6	Mitchell et al., 2008	128
Ghosh et al., 1997	1	Tuerk et al., 2010	47	Morland et al., 2004	20
Goldfield & Boachie, 2003	1			Morland et al., 2010	125
Griffiths et al., 2006	15			Nelson, et al., 2003	28
Hill et al., 2001	2			Ruskin et al., 2004	119
Himle et al., 2006	3				
Kaplan, 1997	2				
Manchanda & McLaren, 1998	1				
Nelson & Bui, 2010	1				
Oakes et al., 2008	1				
Oliver & Demiris, 2010	2				
Passik et al., 2004	8				
Shepard et al., 2006	25				
Shore & Manson, 2004	1				
Simpson, 2001	10				
Simpson et al., 2002	11				
Simpson et al., 2003	12				
Todder et al., 2007	2				
Todder & Kaplan, 2007	1				

* Study is excluded from analysis of research Questions 4–6 due to having overlapping samples with another study.

those as reporting no measures, only nonstandardized measures, or at least one standardized measure. For Questions 7–10, we determined the number of articles that addressed each outcome (feasibility, therapeutic relationship, satisfaction, and clinical outcome data) and reviewed the articles in each category to synthesize the conclusions.

Results

We identified 728 unique articles from the initial electronic searches, and the search of reference lists yielded an additional 93 unique articles. Thus, the total denominator for articles to consider was 821. A total of 756 articles were excluded. Of the excluded articles, 17 (2%) were non-English, 52 (7%) did not have an abstract, 191 (25%) were not focused on psychotherapy, 64 (8%) were nonvideo telemedicine, 13 (2%) were nonpeer reviewed, 368 (49%) were focused on a discipline other than mental health (e.g., radiography, physical therapy, neurology), and 51 (7%) were excluded for other reasons (e.g., nontelemedicine, self-directed therapy). (Note that due to rounding errors, percentages in Results may not always total 100%). Sixty-five articles were identified as meeting our criteria for inclusion. These articles are listed with an asterisk (*) in the Reference section.

Types of Articles (Question 1)

Eighteen (28%) of the 65 articles reviewed were nonempirical studies. Of these, eight (44%) were literature reviews and 10 (56%) offered program descriptions (see Table 2). As we anticipated, we did not find any literature reviews that were solely focused on VCP (which was the impetus for the current review); therefore, we included the eight reviews that included substantial discussions of VCP. There have been a number of excellent reviews that have discussed psychotherapy via VC, but these either presented overviews of some combination of many psychological service domains provided via VC provided via teleconferencing (such as assessment, pharmacotherapy, psychotherapy, education, consultation, or supervision; e.g., Antonacci, Bloch, Saeed, Yildirim, & Talley, 2008; Capner, 2000; Hilty, Marks, Urness, Yellowlees, & Nesbitt, 2004; Monnier, Knapp, & Frueh, 2003; Norman, 2006; Richardson et al., 2009), focused on psychotherapy only but not only VC (e.g., Bee et al., 2008), or focused on neither psychotherapy or VC yet had some discussion about VCP (i.e., Hailey, Roine, & Ohinmaa, 2008).

Table 2
Nonempirical Studies

Literature reviews	Program/Project descriptions
Antonacci et al., 2008	Cartreine et al., 2010
Bee et al., 2008	Egede et al., 2009
Capner, 2000	Folen et al., 2001
Hailey et al., 2008	Freir et al., 1999
Hilty et al., 2004	Gammon et al., 1996
Monnier et al., 2003	Kuulasmaa et al., 2004
Norman, 2006	Mielonen et al., 2002
Richardson et al., 2009	Morland et al., 2009
	Olden et al., 2010
	Wright et al., 1998

Among the program descriptions are pioneering overviews of VC (called "two-way TV") for group therapy (Wittson, Affleck, & Johnson, 1961; Wittson & Benschoter, 1972), a description of a biofeedback telehealth program (Folen, James, Earles, & Andrasik, 2001), an overview of telehealth psychiatry services provided in particular countries (Freir et al., 1999; Gammon, Bergvik, Bergmo, & Pedersen, 1996; Mielonen, Ohinmaa, Moring, & Isohanni, 2002), a description of a university VC program with a focus on family therapy (Kuulasmaa, Wahlberg, & Kuusimaki, 2004), and a description of VCP for caregivers of older adults with dementia (Wright, Bennet, & Gramling, 1998). Additionally, there are discussions about the design of randomized noninferiority trials (Egede et al., 2009; Morland, Green, Rosen, Mauldin, & Frueh, 2009). The noninferiority trials utilize a methodology that will "allow for rigorous comparison of VTC [video teleconferencing] and in-person modalities and a sophisticated analysis of equivalency (noninferiority) . . . used to determine if a novel intervention is no worse than a standard intervention" (Morland et al., 2009, p. 514).

The remaining 47 (72%) articles were empirical studies. There were 21 controlled studies (45% of the empirical studies). Nine nonrandomized trials (19%) and 12 randomized trials (26%) were identified. Twenty-six of the empirical studies (55%) had no control condition for comparison. The majority of the uncontrolled

studies were case study designs (54%; $n = 14$) (e.g., Cowain, 2001), followed by cross-sectional survey designs (35%, $n = 9$; e.g., Simpson, 2001) and case series designs (11%, $n = 3$). Deitsch, Frueh, and Santos (2000) and Simpson, Morrow, Jones, Ferguson, and Brebner (2002) reported on only a single psychotherapy session for each subject. The mean sample size for all of the uncontrolled studies was six participants.

Patterns of Publication Rates (Question 2)

There were only two articles meeting our search and selection criteria that were published before 1996 (i.e., Wittson et al., 1961 and Wittson & Benschoter, 1972), but there was at least one peer-reviewed publication per year during the 15 year period of 1996–2010. Figure 1 excludes the two pre-1996 outliers to illustrate the pattern of publication rates for nonempirical articles, empirical articles, and their combination during three year periods since 1996.

Terms Used (Question 3)

The most frequently used terms within each article to describe the two modes of treatment (remote and in-person) were tabulated and the summary of the terms is listed in Table 3. The most commonly used term to describe the remote mode of treatment was "videoconferencing" (and variations of that term), representing 40% of the articles, followed by "telepsychiatry" (17%) and "telemedicine" (11%). Many articles were focused on descriptions of psychotherapy only provided via videoconferencing (without discussion of in-person psychotherapy), and many of the empirical studies did not offer an in-person control condition. Accordingly, only 28 of the articles used any term for in-person psychotherapy. The most common terms used were "face-to-face" (often abbreviated FTF or F2F; 57%), "in-person" (14%), and "same room" (11%).

Formats and Types of Psychotherapy (Question 4)

Regarding psychotherapy formats studied, of the 42 unique empirical samples, 71% ($n = 30$) reported an individual therapy format (e.g., Bakke, Mitchell, Wonderlich, & Erickson, 2001), 17% ($n = 7$) described group therapy (e.g., Frueh, Henderson, & Myrick, 2005), and 10% ($n = 4$) discussed family therapy (e.g., Hill, Allman, & Ditzler, 2001). The remaining sample (2%; Shore & Manson, 2004) combined individual and group psychotherapy. None of the studies reported using a couples therapy format.

Regarding types of psychotherapy, the largest proportion of samples (45%; $n = 19$) identified cognitive–behavioral therapy (including behavior therapy and exposure therapy) as the primary treatment type (e.g., Bouchard et al., 2000). Treatment types categorized as either eclectic, various, or undefined (e.g., Ruskin et al., 2004) comprised 11 (26%) of the empirical samples utilized. Three samples (7%) utilized VC for various types of family therapy (e.g.,

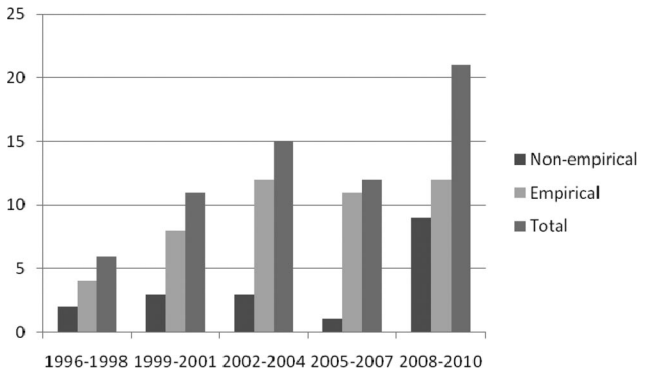

Figure 1. Number of nonempirical, empirical, and total articles published during three year periods since 1996.

Table 3
Terms for Modes of Treatment Most Frequently Used in Reviewed Articles

Traditional therapy	Remote video technology
• Face-to-face treatment or face-to-face therapy (16) • In-person treatment, in-person therapy (4) • Office-based (1) • On-site counseling (1) • Same-room treatment, same-room therapy (3) • Standard therapy, standard behavior therapy interventions (2) • Traditional therapy (1)	• Behavioral telehealth (1) • Computer-based treatment (1) • Interactive video, interactive television (2) • Internet-based videoconferencing (1) • Remote counseling, remote consultation, remote treatment, remote communication technologies, or remote methods (1) • Telecommunications or telecommunications media (1) • Telehealth, telehealth technology, or telehealth-mediated delivery (5) • Telemedicine or telemedicine methods (7) • Telemental health, telemental health services, or telemental healthcare (4) • Telepsychiatry (11) • Telepsychology or rural telepsychology (3) • Telepsychotherapy (1) • Videoconference, videoconference access, videoconference treatment, videoconferencing, videoconferencing utility, video-conferencing, video conference, video teleconferencing, or video-conferencing technology (26) • Videophones (1)

Note. Numbers in parentheses indicate how frequently a term was the primary term used in an article.

Hill et al., 2001), and two (5%) focused on substance abuse treatment programs (e.g., King et al., 2009). For the remaining seven articles (17%), there was one study for each of the following specific treatment types: biofeedback (Earles, Folen, & James, 2001), Dignity Therapy (Passik et al., 2004), hypnosis (Simpson et al., 2002), psychoanalysis (Kaplan, 1997), Eye Movement Desensitization and Reprocessing (Todder & Kaplan, 2007), Problem Solving Therapy (Oliver & Demiris, 2010), and "Coping Skills for PTSD" (Morland, Pierce, & Wong, 2004).

Populations Studied (Question 5)

As noted, there were 42 unique empirical samples. Among these, 36 (86%) studied adults, and one of these was identified as an older adult population (60 years and older). Four of the samples (10%) were composed of children and/or adolescents and two (5%) were mixed or unclear ages. Regarding military status, 31 empirical samples (74%) were civilian (nonmilitary) populations, nine samples (21%) were composed of Veterans, and the remaining two samples (5%) combined civilian and military participants. There were no studies of active duty service members meeting our inclusion criteria.

Across the 42 samples, the majority ($n = 39$) reported data on sex of participants. Among the samples that reported the sex of participants, nearly 60% of participants were male (approximately 800 participants) while female participants (approximately 550 participants) accounted for just over 40%. Only 23 of the 42 unique samples included in our review reported race or ethnicity of study participants, and 14 of the 23 (61%) had samples where at least half of the sample was Caucasian. Notable exceptions included three studies in which a majority of the sample was African American (55%, Frueh et al., 2007), Hispanic (100%, Nelson & Bui, 2010), or American Indian (100%, Shore & Manson, 2004). These studies supported the feasibility and effectiveness of VC in these samples.

Regarding the clinical problems addressed, nine of the samples (21%) were composed of individuals diagnosed with trauma disorders (post traumatic stress disorder and acute stress disorder). Nineteen percent of the sample pop-

ulations ($n = 8$) had general or mixed presenting problems. Twelve percent ($n = 5$) of the sample were comprised of individuals with eating disorders (such as anorexia nervosa and bulimia nervosa). The remaining clinical targets were: mood disorders ($n = 3$; 7%); anxiety disorders other than posttraumatic stress disorder and acute stress disorder ($n = 3$; 7%; two panic disorder with agoraphobia and one obsessive–compulsive disorder); addiction issues ($n = 3$; 7%); pain/psychophysiological issues ($n = 3$; 7%); adjustment to cancer ($n = 3$; 7%); other ($n = 3$; 7%; family issues, gender reassignment, and caregiver stress); and mixed depression and/or anxiety ($n = 2$; 5%).

Assessments Used (Question 6)

Of the 42 unique samples from the empirical studies, seven (17%) did not list any measures used, and all of those articles described uncontrolled studies. Nonstandardized measures, including qualitative questionnaires and interviews (e.g., Bakke et al., 2001; Bischoff, Hollist, Smith, & Flack, 2004; Simpson et al., 2002), and author-created measures (e.g., Cluver, Schuyler, Frueh, Brescia, & Arana, 2005; Deitsch et al., 2000; Harvey-Berino, 1998; King et al., 2009) were used by 11 (48%) of the articles. At least one standardized measure with well-accepted psychometrics was reported by 29 (69%) of the empirical studies. The most common measures were versions of the Beck Depression Inventory (BDI; e.g., BDI-II; Beck, Steer, & Brown, 1996), which was cited in 10 different articles; the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989), which was cited in nine different articles; and the Structured Clinical Interview for the *DSM–IV* (SCID-IV; SCID-I; First, Spitzer, Gibbon, & Williams, 1996), which was cited in six different articles.

Feasibility (Question 7)

The authors in each of the articles reviewed indicated that VC was a feasible means to deliver psychotherapy. As noted above, VCP has been successfully used in several formats using various types of psychotherapy. Researchers reported the successful expression and interpretation of emotions via VC (Bischoff et al., 2004; Cluver et al., 2005; Deitsch et al., 2000; Frueh et al., 2005; Griffiths, Blignault, & Yellowlees, 2006; Hill et al., 2001; Manchanda & McLauren, 1998; Oliver & Demiris, 2010; Simpson, 2001; Simpson et al., 2002). Moreover, programs offering telehealth services may realize decreased costs for patients in terms of time and travel expenses (Davalos, French, Burdick, & Simmons, 2009; Grady, 2002). Eighteen of the 47 empirical studies (38%) explicitly addressed how this mode of treatment can contribute to reductions in travel burdens and costs, reduced intervention costs, and/or increased access to care for rural, underserved, or geographically isolated populations.

Therapeutic Relationship (Question 8)

Of the 47 empirical articles, 16 (34%) examined the patient-provider relationship in therapy. Fourteen of these studies concluded that patients and providers perceive a strong therapeutic alliance over VC (e.g., Bouchard et al., 2000; Ghosh, McLaren, & Watson, 1997; Morgan, Patrick, & Magaletta, 2008; Simpson, 2001), comparable to in-person sessions (Germain et al., 2010). Some patients discussed enhancement of the therapeutic relationship during VC (Simpson, 2001). However, in one family therapy group (Glueckauf et al., 2002) and in another group therapy setting (Green et al., 2010), the patients reported lower therapeutic alliance with the provider when using VC compared to those who received treatment in person. In the Glueckauf et al. study, teens with epilepsy and their parents rated the quality of the therapeutic relationship across three modalities (face-to-face in office, by speakerphone, and by VC). The parents rated the therapeutic relationship as good across the three modalities (and there were no differences among the modalities). The teens, however, reported that in the VC condition the therapeutic alliance was weaker. The authors speculated that the neuropsychological deficits that can co-occur with epilepsy may have made it difficult to encode and interpret social interactions in that format. In the Green et al. study of group anger management therapy provided face-to-face in office or by VC, the participants (male Veterans) in both conditions rated therapeutic alliance as high (over 4 on a 5-point scale, suggesting agreement with positive statements about the relationship), but there was more variance in the

VC condition and the ratings in the VC condition were significantly lower than the face-to-face condition. While ratings of alliance did predict clinical outcomes for individuals, the mean ratings within conditions did not mediate outcomes between the conditions (in which VC was not inferior to face-to-face treatment). The authors posited that alliance may have been impacted by the nature of the treatment (a long, intense, group-based intervention) or patient-specific factors (such as comfort with technology or treatment history). As with the Glueckauf et al. study, it is possible that group interventions via VC may be challenging for some individuals due to the potential for increased distractions and competing stimuli (e.g., the presence of other people in the room and video equipment in the room).

Satisfaction (Question 9)

Twenty-six of the 47 articles (55%) examined patient and/or provider satisfaction. In studies without a comparison group, researchers often concluded that users were generally satisfied when engaging in psychotherapy over telemedicine (Deitsch et al., 2000; Frueh et al., 2005; Myers, Valentine, & Melzer, 2008; Simpson, Bell, & Britton, 2006; Simpson et al., 2003; Simpson et al., 2002), and studies that compared VC to in-person psychotherapy reported similar satisfaction levels between the conditions (Cluver et al., 2005; King et al., 2009; Morgan et al., 2008; Nelson, Barnard, & Cain, 2003; Ruskin et al., 2004). When sources of dissatisfaction arose, they primarily involved technical challenges, but such issues appeared to have little impact on overall satisfaction levels (e.g., Cowain, 2001; Folen et al., 2001). Both the patient-provider relationship in therapy and patient and/or provider satisfaction was reported in seven (15%) of the studies.

Clinical Outcome Data (Question 10)

For our final research question, we sought to determine if the clinical outcome data for VCP is comparable to in-person psychotherapy. Sixty percent ($n = 28$) of the 47 articles examined clinical outcomes. We have organized the results into five general categories of clinical problems studied in those 28 articles: depression and/or anxiety (including posttraumatic stress disorder and acute stress disorder), eating disorders, physical problems, miscellaneous, and addictions. We draw particular attention to the outcomes from randomized empirical studies.

Ten of the 47 empirical articles (21%) presented clinical outcome data on anxiety and/or depression (see Table 4). Two randomized empirical studies (Nelson et al., 2003; Ruskin et al., 2004) reported no significant differences between in-person conditions and VCP conditions for symptoms of anxiety and depression, with both conditions showing symptom improvement. Interestingly, Nelson and colleagues (2003) found the VCP group to have a faster decline in depressive symptoms as compared to the in-person group. These outcomes are supported by less rigorous studies that reported improved clinical outcomes for VCP patients with anxiety and/or depression. Posttraumatic stress disorder was specifically examined by Frueh et al. (2007) in a RCT and by Tuerk, Yoder, Ruggiero, Gros, & Acierno (2010), and Germain et al. (2009) in nonrandomized comparisons studies. While the two nonrandomized studies found no major differences between the in-person groups and the VCP groups (both groups demonstrated clinical improvements), in the randomized study neither group had significant changes in their posttraumatic stress disorder (PTSD) symptoms.

Six of the 47 empirical articles (13%) presented clinical outcomes for patients with eating disorders (see Table 5). Mitchell et al. (2008) was the only study with a randomized comparison between in-person treatment and VCP. Their results indicated that both the in-person and VCP groups had similar treatment retention and both showed clinical improvements, including reduced binging and purging frequencies and abstinence from binging and purging behaviors. However, the in-person group had a statistically greater reduction in eating-related distorted cognitions than the VCP group. The in-person group experienced a greater reduction in self-reported disordered eating-related cognitions and depressive symptoms, although the authors noted that, "the differences overall were few in number and of marginal clinical significance" (Mitchell et al., 2008, p. 581). These results are supported by the additional studies examining clinical outcomes for eating disor-

Table 4
Clinical Data: Depression and Anxiety Disorders

Study	Problem	Outcomes	Type of study*
Bouchard et al., 2000	Panic w/agoraphobia	(−) Panic attacks (severity and frequency), panic apprehension, severity of disorder (+) Global functioning, perceived self-efficacy	EU
Cowain, 2001	Anxiety & depression	(+) Functioning (−) Depression/anxiety	EU
Manchanda & McLaren, 1998	Anxiety & depression	(−) Anxiety/depression	EU
Himle et al., 2006	OCD	(−) OCD symptoms (+) Global functioning	EU
Bouchard et al., 2004	Panic w/agoraphobia	Majority of both groups free of panic symptoms	EN
Germain et al., 2009	PTSD	Both conditions: (−) PTSD, anxiety and depression (+) Overall functioning and perceptions of physical and mental health	EN
Tuerk et al., 2010	PTSD	Both conditions: (−) PTSD symptoms (−) Depression	EN
*Frueh, Monnier, Grubaugh, et al., 2007	PTSD-combat	Neither modality had significant changes in symptoms	ER
Nelson et al., 2003	Depression	All modalities were effective at (−) depression; VCP group had faster decline of symptoms	ER
Ruskin et al., 2004	Depression/anxiety	No significant differences between conditions, both had: (−) Depression/anxiety (+) Health and GAF	ER

Note. EU = Empirical Uncontrolled; EN = Empirical Nonrandomized Control; ER = Empirical Randomized Control.

ders, which generally reported improvements in symptom presentation.

Four of the empirical studies (9%) addressed outcomes related to a variety of physical health concerns (see Table 6). The only RCT focused on patients with epilepsy (Glueckauf et al., 2002). Results indicated no significant differences between the in-person and VCP groups, and both showed clinical improvement. The remaining studies found VCP to have positive outcomes for patients with chronic pain and irritable bowel problems (Earles et al., 2001), cancer (Shepherd et al., 2006), and obesity (Harvey-Berino, 1998).

Five of the empirical studies found positive outcomes for miscellaneous clinical areas such as parent–child problems, gender reassignment, mood disorders, adjustment, and anger (see Table 7). In the only RCT, Morland and others (2010) found VCP to be just as effective as in person for treating individuals with anger difficulties.

Three of the empirical studies (6%) provided clinical outcome data for addiction related problems, including alcohol, substance abuse, and gambling (see Table 8). All three studies indicated that VCP was an effective method for delivering addiction focused interventions.

Discussion

The aims of this systematic review were to identify, synthesize, and interpret the literature on VCP by using a predefined search and selection protocol to answer 10 specific questions. We will discuss the issues relevant to each of the 10 questions we posed.

Types of Articles (Question 1)

Among the 65 articles selected for review were 18 nonempirical studies, split almost evenly between literature reviews and program descriptions. None of the reviews focused solely on VCP, but they provided rich discussions and analyses of issues that are relevant to VCP. The program descriptions can be useful guides to individuals who are interested in the

Table 5
Clinical Data: Eating Disorders

Study	Problem	Outcomes	Type of study*
Bakke et al., 2001	Bulimia nervosa	Absence of binge/purge at follow-up	EU
Goldfield & Boachie, 2003	Anorexia nervosa	(+) Weight Improved medical condition	EU
Simpson et al., 2003	Eating disorders	(−) Symptoms (+) Nutritional knowledge (+) Nutritional content of diet	EU
Simpson et al., 2006	Bulimia nervosa	(−) Binging (for half (6) of participants) (−) Purging (for 1 participant) (−) Depression (for 5 participants) (−) Borderline symptoms (for 4 participants)	EN
Marrone et al., 2009	Bulimia nervosa	Operating characteristics analysis: Reduction in binge eating at 6th week is associated with best outcomes for VCP; 8th week for in person	ER
Mitchell et al., 2008	Bulimia nervosa	Both conditions had similar retention rates Both groups showed clinical improvements, but in person group had slightly greater (−) in distorted cognitions and depression.	ER

Note. EU = Empirical Uncontrolled; EN = Empirical Nonrandomized Control; ER = Empirical Randomized Control.

logistics of beginning clinical work or research in the field. There were 47 empirical studies since 1996, representing nearly three quarters of the articles reviewed. However, the methodology in many of the extant studies was weak, and these limitations make it difficult for providers and researchers to replicate and compare results. Over half of the studies presented uncontrolled data (e.g., case studies, case series, cross-sectional surveys) with small samples, which could allow a number of untested confounding variables to influence the results. In our experience, it is easier to enlist participants for traditional in person psychotherapy than for VCP, so it is likely that control subjects could be recruited for most studies of VCP.

Several of the studies had reported on shared samples. It was not always clear from the written reports when samples were overlapping, which would result in an apparent inflation in the quantity of studies. In fact, only 42 unique samples were studied and only 21% of those

Table 6
Clinical Data: Physical Problems

Study	Problem	Outcomes	Type of study*
Earles et al., 2001	Chronic pain & irritable bowel	(−) Pain (−) Pain medication (−) Bowel irritability (+) Ability to relax (+) Outlook (+) Mood	EU
Shepard et al., 2006	Cancer	(−) General distress (−) Anxiety (+) Wellbeing (emotional, functional, physical)	EU
Harvey-Berino, 1998	Obesity	Both groups: (−) Weight (+) Eating behaviors, exercise	EN
Glueckauf et al., 2002	Epilepsy	(−) In problem severity, frequency (+) Prosocial behaviors	ER

Note. EU = Empirical Uncontrolled; EN = Empirical Nonrandomized Control; ER = Empirical Randomized Control.

Table 7
Clinical Data: Miscellaneous

Study	Problem	Outcomes	Type of study*
Ghosh et al., 1997	Gender reassignment	(+) Social and clinical adjustment	EU
Nelson & Bui, 2010	Parent-child problem	(+) Anger management skills (+) Parenting skills (+) Parent-Child Communication	EU
Grady & Melcer, 2005	Variety (mood, anxiety, personality)	Both groups showed improvement in: GAF and medication compliance but VCP was significantly better than in person for both No differences between groups in # of labs ordered, self-help recommendations made, # of patients prescribed 2 or more medications	EN
Day & Schneider, 2002	Variety (e.g. family problems, body/image)	No significant differences between modalities (speaker phone, in person, VCP) in therapeutic process or outcomes	ER
Morland et al., 2010	Anger	No significant differences between modalities: (−) Anger symptoms	ER

Note. EU = Empirical Uncontrolled; EN = Empirical Nonrandomized Control; ER = Empirical Randomized Control.

had subjects randomized to condition. Moreover, some studies reported nonmanualized or blended interventions (e.g., psychotherapy and pharmacotherapy; individual and group therapy) and mixed diagnostic groups. Many of the controlled studies described differences between VC and in-person conditions but neglected to discuss the statistical or clinical significance of within-group changes. The majority of the controlled studies presented superiority designs, and these were generally underpowered due to small sample sizes, potentially missing true differences between conditions. The lack of statistical differences in these studies does not mean that outcomes from VC and in-person are identical, and noninferiority and equivalence designs offer an alternative to the standard approach (Greene, Morland, Durkalski, & Frueh, 2008). As Richardson et al. (2009) stated with regard to VC for interventions more broadly, the evidence base for VCP remains underdeveloped.

Patterns of Publication Rates (Question 2)

Within the parameters of our search criteria, we found only two publications focused on VCP prior to 1996, reflecting that this area of study is in early stages. Consistent with the observation that general telemental health publications have increased rapidly in recent years (Richardson et al., 2009), we found a similar (though less pronounced) pattern of increased publications on VCP. The number of nonempirical articles published from 2008 to 2010 equaled the sum of all such publications from

Table 8
Clinical Data: Addiction

Study	Problem	Outcomes	Type of study*
Frueh et al., 2005	Alcohol	(+) Participant alcohol abstinence	EU
Oakes et al., 2008	Gambling	(−) Indicators of problem gambling (+) Work adjustment (+) Social adjustment (−) Depression/anxiety	EU
King et al., 2009	Substance abuse	No significant differences between groups: (+) Abstinence and attendance	ER

Note. EU = Empirical Uncontrolled; EN = Empirical Nonrandomized Control; ER = Empirical Randomized Control.

1996 to 2007. Similarly, the number of empirical publications from 2002 to 2010 was nearly triple such publications from 1996 to 2001. During each of the 3-year periods starting in 1996, the number of empirical publications has outpaced the nonempirical publications, suggesting that future years may continue that trend and bring additional original data to guide work in this field. The total number of publications demonstrates a near-linear trend of more frequent publications in recent years, and the most recent three years together represent a third of all publications in the past 15 years.

Terms Used (Question 3)

Several of the review articles included in this review appeared to equate telehealth, telemental health, e-health, or telepsychiatry with VC (Antonacci et al., 2008, noted that these terms are often used interchangeably). Multiple terms were used within many articles to denote psychotherapy via remote video technology, and often the term used in the title of an article was not the term used most frequently in the body of the text. As the field has developed, it has become more important to be precise in technical terminology for mental health services provided remotely to convey specifically what format was used and to ensure inclusion of relevant studies in literature reviews.

Many of the empirical studies we reviewed did not offer an in-person control condition, but when it was discussed, traditional in-person psychotherapy was most often referred to as "face-to-face." The terms "in person" and "same room" were less frequently used, but we argue that these terms are more descriptive (since in VC, participants are also "face-to-face" onscreen), and thus, we have used the term "in person" in this article. "Videoconferencing" was the most commonly used term to describe remote treatment, so a search for that term should yield the most appropriate articles on the topic. We encourage other researchers who focus on this mode to use that term rather than more generic terms. "Videoconferencing" has the advantage of being more precisely defined (it is more specific than the terms "telehealth" or "telemedicine"), and it includes images and sounds conveyed through different types of equipment such as video phones and computers. We chose the term "Videoconferencing Psychotherapy" for this review because it conveys the type and remote mode of treatment most efficiently and accurately. After we had conducted our review, we realized that before the terms "telemedicine" and "telehealth" were in wide use, the technology was sometimes described as "two-way TV" or "interactive TV" (e.g., Wittson, Affleck, & Johnson, 1961; Wittson & Benschoter, 1972), so those terms should be included in future searches for VCP.

Formats and Types of Psychotherapy (Question 4)

The literature covered a range of treatment types and therapy formats, with the largest proportion of studies utilizing individual CBT to investigate VCP. Nearly one half of the psychotherapies studied were described as CBT. Although CBT is a broad term that can encompass a wide range of techniques, there is clear evidence that manualized treatments like CBTs can be conducted via VC. Group, couples, and family therapy present some particular technical challenges and possibilities for providers choosing to use VC technology, and more studies of psychotherapies in these formats are necessary to inform providers about these issues. Over a quarter of the empirical studies did not define the intervention or described eclectic psychotherapies. Clear descriptions of established treatment protocols will advance the knowledge base by helping clinicians and researchers replicate and extend the work that has been done.

Populations Studied (Question 5)

VCP has been applied to individuals with many clinical conditions. The largest category of problems addressed was trauma disorders (including PTSD and acute stress disorder). The next largest category of clinical conditions studied was general or mixed presenting problems. While such heterogeneous samples may be easier to recruit, it is challenging to interpret findings of mixed diagnostic groups. VCP may be particularly well suited to trauma disorders. One of the hallmarks of PTSD is avoidance of uncomfortable situations that may remind the person of the traumatic event, and, in our own work, some individuals with PTSD have told us that psychotherapy by VC offers a more com-

fortable therapeutic distance between them and the provider as the therapeutic relationship is being established (Thorp, Fidler, Moreno, Floto, & Agha, 2012, pp. 198–199). Patients may be initially reluctant to disclose personal information, even to mental health professionals (Olden et al., 2010). Telehealth can encourage patients to exchange more information with the provider since they feel less intimidated than during in-person interactions (Kavanagh & Yellowlees, 1995; Tachakra & Rajani, 2002; Wootton, Yellowlees, & McLaren, 2003). In fact, some patients rated telehealth higher than in-person encounters in terms of ease of self-expression (Chae, Park, Cho, Hung, & Cheon, 2000). There is a need for more data describing VCP with generalized anxiety disorder, phobias, and personality disorders, as these disorders may pose particular challenges or benefits in this modality (e.g., maintaining clinical focus; maintaining therapeutic alliance; conducting specific exposure therapies at a distance).

There were four VCP studies of children and/or adolescents, but only one description of a large RCT (in progress) of VCP for older adults (Egede et al., 2009). Richardson et al. (2009) notes that, given potential limitations in transportation and mobility, older adults in particular may benefit from mental health services by VCP. However, older adults may also have discomfort with using VCP equipment, and may have sensory impairments (e.g., difficulty hearing) that could interfere with that mode of treatment (Jones & Ruskin, 2001). In our own work, we have found that older adults can become more comfortable with the VCP format with time, and with hearing difficulties communication may be improved with headphones or a zoomed lens on a therapist's lips (Thorp, et al., this issue).

While there appears to be an adequate balance of men and women included in studies of VCP, there is a need for greater attention to potential differences in process variables and outcomes related to sex of participants. Few of the studies reported results separately by sex or had hypotheses or analyses focused on sex differences. Thus, the lack of focus on this issue could reflect that there truly are no differences in feasibility, satisfaction, alliance, and clinical outcomes or it could reflect a lack of attention to this topic. It is certainly possible that sex could influence feelings of alliance in the video format or comfort with technology generally, so it appears that the issue is deserving of more empirical analysis.

There have been few studies of telemental health that address ethnic and racial differences among participants and how it impacts services, and these have focused primarily on assessment services (Richardson et al., 2009). More studies with a focus on potential racial and ethnic differences would be worthwhile. Minorities may face greater obstacles to accessing empirically based psychotherapies, and thus VCP has the potential to increase access for these groups. Cross-cultural studies could inform how comfort with the technology may differ across cultures.

Assessments Used (Question 6)

Many of the studies we examined used multiple standardized instruments to assess broad domains of clinical and process variables. However, over one third of the empirical studies we reviewed reported either nonstandardized measures or no measures at all. While customized measurement (unstructured interviews and author-created instruments) may augment standardized instruments, the field is sufficiently advanced to demand psychometrically sound instruments be used in all empirical studies of VCP. We surveyed the most common instruments used across studies (full list available on request) to guide future providers and researchers, and found that the BDI was the most popular choice (reflecting the studies of mood disorders and comorbid mood symptoms). The WAI was used often to contrast therapeutic alliance between modes of treatment, and the SCID was conducted to confirm psychiatric diagnoses. The broad use of these measures with established reliability and validity suggests that they are good choices for many VCP studies.

Feasibility (Question 7)

The extant literature shows that many psychotherapy types have been delivered through VC, and these psychotherapies have addressed a wide range of clinical problems. Importantly, studies generally agreed that participants are able to express and interpret emotions through the live video format. Many of the researchers noted that only minimal changes were required

to conduct psychotherapy via VC. Indeed, primarily what is absent in VCP is the ability to use senses of touch and smell, which are used sparingly in most psychotherapies. There are some differences in the quality of the visual and auditory stimuli that are available through VC (see Thorp, et al., this issue; e.g., more limited visual range, potential for visual or auditory artifacts such as grainy images and delayed sounds), and these possibilities should be discussed with patients at the outset of treatment in this modality. Moreover, crisis procedures must be modified because the therapist will not be in the same room. This includes the therapist knowing the phone number and address of the patient location and having a clear plan in place with the patient and clinical personnel at the remote location (Thorp et al., in press).

The term feasibility can encompass many domains, and more than a third of the studies addressed specific facets of feasibility (e.g., costs, access). The field has advanced to a point where procedures and measurement could be established to monitor these particular aspects of feasibility. It will be important for future studies to more precisely define what type of feasibility is being measured, so that researchers and clinicians can evaluate the feasibility of VCP by settings, psychotherapy formats, psychotherapy types, populations, cost, logistics, and access.

Therapeutic Relationship (Question 8)

One third of the studies we reviewed examined the quality of the therapeutic relationship in VCP. Most found that therapeutic alliance was strong in VCP, and in most of the controlled studies the ratings of therapeutic alliance was found to be equivalent between VCP and in-person psychotherapy. However, a few articles reported an enhanced (Simpson, 2001) or diminished (Glueckauf et al., 2002; Green et al., 2010) alliance via VCP. Future studies could investigate how alliance is influenced by population type (e.g., rapport may be more difficult to establish with some diagnoses), therapy format (e.g., individual vs. group), or technology used (e.g., standard videoconferencing equipment, video phones, online teleconferencing).

Satisfaction (Question 9)

Slightly more than half of the studies we included in our review assessed satisfaction, and these generally found that patients and providers were satisfied with the format despite occasional frustrations with technical issues. Satisfaction with videoconferencing will likely improve as audio and video technology advances. The use of satisfaction as an outcome has been criticized due to limitations in study methodologies (Mair & Whitten, 2000; Norman, 2006; Richardson et al., 2009). For example, many of the studies have not included a control condition, making it difficult to differentiate satisfaction with the *format* from satisfaction with the *treatment*. Additionally, authors have created many customized measures of satisfaction with unclear psychometric properties, and the lack of standardization of the measures makes it difficult to compare results across studies. In addition to general satisfaction, it is important to measure sources of satisfaction (e.g., convenience, therapeutic distance) and dissatisfaction (e.g., audiovisual problems; feeling disconnected). It is recommended that, when satisfaction is included as an outcome variable in VCP studies, reliable and valid measures of satisfaction should be used, the measures should allow for some detail about sources of satisfaction and dissatisfaction and should serve as an adjunct to other clinical outcome measures, and control conditions should be included when possible.

Clinical Outcome Data (Question 10)

Two-thirds of the studies examined clinical outcome data. Across the broad range of clinical problems that were addressed, the researchers reported that care provided via VCP worked well, and the Nelson et al. (2003) study concluded that it worked a little faster than in person treatment. As we have suggested, it is possible that individuals with different psychiatric diagnoses may differentially respond to treatment via VC, but the numbers of studies for different diagnoses remain too small for meaningful meta-analyses of those differences to be performed. In addition, as we have noted, many of the studies have suffered from weak methodological design and small sample sizes. Moreover, for some studies it was unclear if the

interventions produced statistically or clinically significant changes (in either condition, if a control group was utilized).

Conclusions and Recommendations

Telehealth can encompass many technologies, and there are many mental health services that have been delivered by telehealth, including assessment, psychoeducation, training, consultation, and supervision. Current advances in technology, including telehealth in general and VCP in particular, offer an innovative solution to the mental health provider shortage in rural areas and for some specialties. Based on the growing literature base of VCP, we concluded that the more focused field of psychotherapy via videoconferencing was mature enough to merit a systematic review. We sought answers to 10 general questions about VCP. Overall, the literature regarding the provision of VCP has been expanding and the general findings are supportive of VCP as a treatment option. It appears clear that video telehealth is feasible, at least in some contexts and in some situations. The data also suggest that most users of the technology (both patients and providers) are satisfied with this mode of treatment for psychotherapy. Thus, there is some preliminary outcome evidence that VCP is a viable alternative to in person therapy, but further research is needed in this area.

Several important issues have not been addressed systematically or commonly within the VCP literature and were outside the planned scope of our review. We did not address liability, issues about consent, sense of control, legal issues, reimbursement issues, ethical issues, contraindications, or regulatory and licensure issues, but we have cited excellent reviews that discuss these issues in telehealth generally. We noted that within VC treatment studies, the clinical impact of gender and ethnoracial factors on outcomes remains unclear. More diverse samples are needed to ensure adequate power to test hypotheses about these variables. We did not conduct a meta-analysis of clinical outcomes because there are only 21 controlled studies to analyze and nine of these did not randomly assign participants to condition.

As Frueh et al. (2000) and Schopp et al. (2006) have suggested, it is important to consider whether successful video telehealth programs can be sustained. Sustainability will be influenced by ongoing provider training, patient education, maintenance and upgrading of equipment, and reimbursement of health care provided through videoconferencing. The adoption of new technologies, such as smart phones with interactive video, may encourage the use of VCP. However, these technologies may also generate new issues of crisis management, liability, and confidentiality.

We agree with Frueh et al. (2004) that the field of telepsychiatry is young, and, therefore, more efficacy studies, with strong internal validity, are recommended. Most standard clinical trial approaches are designed to examine differences rather than equivalence or noninferiority in outcomes, but because we do not expect meetings by VC to be superior to meetings in person, the latter designs are more appropriate. Although small clinical trials with low statistical power have been useful for demonstrating adequate and general feasibility and satisfaction with VCP, such trials are unlikely to show true differences in clinical outcomes between VCP and in-person care. These trials lack the statistical power to provide real evidence of equivalence or noninferiority (Greene et al., 2008). Randomized noninferiority designs may offer stronger evidence that VCP is as good as in-person treatment. Noninferiority trials establish what would constitute clinically significant differences in outcomes and test whether one treatment produces results that are clinically noninferior to another (standard) treatment, but these trials often require large sample sizes (Morland et al., 2010).

In conclusion, VCP shows great promise as an alternative to traditional in-person psychotherapy, and improvements in technology will make this modality more accessible. However, many of the recommendations of Frueh et al. (2000) still hold today: there remains a need for additional large scale, randomized clinical outcome trials which will provide important information about the efficacy, and eventually effectiveness of VCP (including process variables, clinical outcomes, relative rates of attrition, and cost-effectiveness). The stronger studies will have large sample sizes, standardized measurement of variables of interest, well operationalized treatment protocols, and measures of treatment adherence, attrition, therapeutic alliance, feasibility, satisfaction,

and clinical outcomes of these services for a variety of populations.

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